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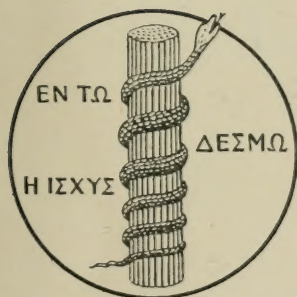
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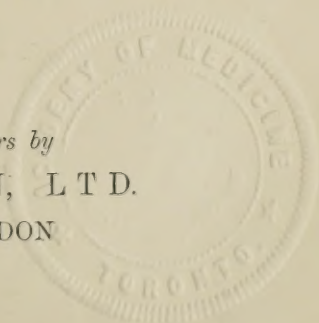
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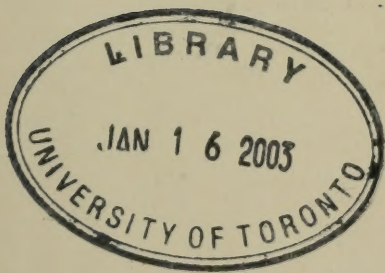
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MEDICAL EDUCATION IN SCOTLAND.

ACCORDING to the Regulations of the General Medical Council, a candidate for a medical qualification must (1) pass a preliminary examination ; (2) register as a medical student ; (3) study for five years at a recognised school ; (4) obtain a degree or diploma ; and (5) place his name on the *Medical Register*. No person whose name is not on the *Register* may legally sign certificates, give medical evidence in Courts, or sue for fees.

The following degrees and diplomas are available in Scotland :—Bachelor of Medicine and Bachelor of Surgery (M.B., Ch.B.), conferred by the Universities. Doctor of Medicine (M.D.) and Master of Surgery (Ch.M.) are higher qualifications conferred only on those who already hold the M.B., Ch.B.

The *Triple Qualification* (L.R.C.P.E., L.R.C.S.E., L.R.F.P.S.G.) is conferred by the two Royal Colleges and the Royal Faculty jointly. The Fellowships, Memberships, and Licences of these Corporations may also be registered as higher or additional qualifications.

Special degrees and diplomas in public health are also granted by the Universities and Corporations.

THE UNIVERSITIES.

PRELIMINARY EXAMINATION.—Before commencing his course of medical study each student shall pass a preliminary examination in (1) English, (2) Latin, (3) Mathematics, and (4) an additional language—Greek, French, German, Italian, or such other as the Senatus shall approve. In the case of a candidate whose native language is other than English, an examination in another classical language—e.g., Sanskrit or Arabic—may be substituted for Latin, and an examination in the candidate's native language may be substituted for the additional language. A student must pass all the subjects at not more than two examinations. A degree in Arts or Science of any recognised University exempts from the preliminary, and certain other examinations may be accepted as substitutes.

MATRICULATION.—Having passed the preliminary examination, the student must, within fifteen days after the commencement of the session, matriculate at the University and pay the fee, which is £1, 1s. for the whole year, 10s. 6d. for the summer session alone.

REGISTRATION.—Within fifteen days of commencing his studies he must register as a medical student. He must be not less than sixteen years of age, must have passed the preliminary examination, and must show that he has begun his medical studies.

THE CARNEGIE TRUST.—This Trust is prepared to pay the class fees of students (who have passed the specified preliminary examination) for all classes, whether attended within the Universities or in any of the Extra-Mural Schools. It is also prepared to pay the fees for the various special classes given by many of the Lecturers upon advanced and non-compulsory subjects. Applicants (1) must be over sixteen years of age ; (2) must be of Scottish birth or extraction, or must have given two years' attendance after the age of fourteen at a school or institution under inspection of the Scottish Education Department ; and (3) must be qualified by preliminary examination under the ordinances of the Scottish Universities Commission and the regulations of the Joint Board of Examiners, to attend the classes for which

payment of fees has been claimed. Schedules of application for admission to the benefit of the Trust are obtainable by written application to the Secretary of the Trust, 14 Hanover Street, Edinburgh.

UNIVERSITY OF EDINBURGH.

The University of Edinburgh offers many attractions to the student of medicine. The various departments are well equipped for purposes of teaching and research, and there are ample facilities for clinical instruction. The Royal Infirmary, the Royal Hospital for Sick Children, and the Royal Maternity Hospital are in the immediate vicinity of the University, while the Royal Asylum for the Insane, the Fever Hospital, and the various dispensaries can be reached within half an hour.

Students may attend one half of their classes in the Extra-Mural School, and are thus offered a choice of teachers on the different subjects of the curriculum.

An important agreement between the University and the Royal Infirmary has been reached by which the teaching resources of the latter are more fully available for University students than formerly. The agreement provides that all the senior members of the Infirmary staff (those in charge of wards) become senior University lecturers and examiners, while the assistant physicians and surgeons become University lecturers, and take a share in the clinical teaching. The clinical tutors also take a recognised place in University teaching, and their demonstrations are to be held at a morning hour instead of in the evening. There can be little doubt that the latter change gives the study of side-room work an enhanced value in the mind of the student.

Since the war broke out a very large number of students and several of the teachers have joined His Majesty's forces. The reduction in numbers has been somewhat proportionate, and with a little rearrangement the teaching has been adequately maintained, while every facility has been offered to senior students to qualify as soon as possible. During the autumn recess a special class of clinical medicine for senior students intending to take military duty has been held.

The social side of student life is provided for in many ways. The University Union, with a membership of 1500, has a fine debating-hall, libraries, reading rooms, billiard rooms, and a catering department.

The Royal Medical Society, founded in 1737, offers the student the advantages of a fine medical library and reading rooms, while in its spacious hall in Melbourne Place many whose names have since become famous have made their first essay in medical debate. The Australasian Club and South African Union are the headquarters of student patriots from these quarters of the world.

The Town and Gown Association provide a number of student residences, which are managed by a committee of the residents.

A full curriculum for women students, recognised by the University, is provided by the Edinburgh School of Medicine at Surgeons' Hall. Women students have their own union, halls of residence, and athletic field (see p. xii.).

Under a recent regulation attendance on classes of instruction in the various special departments is compulsory. This change has necessitated a rearrangement of the curriculum, and an important regulation was introduced which has the effect of limiting a student's attendance on later subjects of the curriculum until he has passed the professional examinations on the earlier subjects.

The new scheme has worked well. Students now begin clinical medicine and pathology in their third year, and the general experience of this arrangement has been favourable. The clinical teachers have found that while they are sometimes handicapped by the students' ignorance of pathology they have the advantage of teaching the practical applications of physiology before that subject is forgotten.

Particulars regarding the curriculum will be found in the University calendar or "medical programme," published by James Thin, 55 South Bridge. It is recommended that students begin study in the Summer Session. The curriculum is as follows:—

FOR STUDENTS BEGINNING IN SUMMER.

<i>First Summer Term</i> —						Hour of Meeting of Class.
Botany	.	.	.	.	.	8-9
Zoology	.	.	.	.	.	12-1
Practical Botany	} On alternate days	{	.	.	.	9-11
Practical Zoology			.	.	.	10-12
Practical Anatomy (thrice weekly)			.	.	.	Afternoon

(Examination in Botany and Zoology.)

First Year.

<i>Winter (1st Term)</i> —						
Practical Chemistry (twice weekly)	.	.	.	.	.	9-11
Anatomy	.	.	.	.	.	11-12
Chemistry	.	.	.	.	.	12-1
Physics ¹	.	.	.	.	.	1-2
Practical Anatomy	.	.	.	.	.	Afternoon

<i>Winter (2nd Term)</i> —						
Practical Chemistry (twice weekly)	.	.	.	.	.	9-11
Anatomy	.	.	.	.	.	11-12
Chemistry	.	.	.	.	.	12-1
Physics ¹	.	.	.	.	.	1-2
Practical Anatomy	.	.	.	.	.	Afternoon

(Examination in Chemistry and Physics.)

<i>Summer Term</i> —						
Histology	.	.	.	.	.	8-10 or 11-1
Practical Anatomy.	.	.	.	.	.

Second Year.

<i>Winter (1st Term)</i> —						
Physiology	.	.	.	.	.	10-11
Practical Physiology (twice weekly).	.	.	.	.	.	11-1
Practical Anatomy and Demonstrations.	.	.	.	.	.

<i>Winter (2nd Term)</i> —						
Physiology	.	.	.	.	.	10-11
Practical Physiology (twice weekly).	.	.	.	.	.	11-1
Practical Anatomy and Demonstrations.	.	.	.	.	.

(Examination in Anatomy and Physiology.)

<i>Summer Term</i> —						
Pathology (Practical) (thrice weekly)	.	.	.	.	.	8-10
Pathology (Morbid Anatomy)	.	.	.	.	.	10-11
Surgical Out-patients	.	.	.	.	.	11-12
Clinical Surgery	.	.	.	.	.	12-2
Practical Materia Medica	.	.	.	.	.	Various hours

Third Year.

<i>Winter (1st Term)</i> —						
Medicine	.	.	.	.	.	9-10
Pathology (Morbid Anatomy)	.	.	.	.	.	10-11
Clinical Medicine	.	.	.	.	.	11-1
Materia Medica	.	.	.	.	.	2-3
Pathology (including Elementary Bacteriology)	.	.	.	.	.	3-4

¹ The class of Physics meets thrice weekly during the Winter Session.

*Winter (2nd Term)—*Hour of Meeting
of Class.

Medicine	.	.	.	.	.	.	9-10
Pathology (Morbid Anatomy)	.	.	.	.	.	.	10-11
Clinical Medicine	.	.	.	.	.	.	12-1.30
Materia Medica	.	.	.	.	.	.	2-3
Pathology (including Elementary Bacteriology)	.	.	.	.	.	.	3-4

*(Examination in Pathology and Materia Medica.)**Summer Term—*

Out-patients (Medical)	.	.	.	.	.	.	11-1
Vaccination	.	.	.	.	.	.	3-4
Dispensary Practice	.	.	.	.	.	.	Afternoon

Fourth Year.*Winter (1st Term)—*

Surgery	.	.	.	.	.	.	9-10
Midwifery (including Gynecology)	.	.	.	.	.	.	10-11
* Sec. A. Diseases of Skin	} 11-12	Clinical Surgery	.	.	.	.	12-2
* " B. Diseases of Eye							
* " C. Diseases of Ear, etc.							
Dispensary Practice.	} .	.	.	.	.	.	Afternoon
Infectious Diseases (once weekly)							
Anæsthetics. ¹							
Optional Classes. ²							

Winter (2nd Term)—

Surgery	.	.	.	.	.	.	9-10
Midwifery (including Gynecology)	.	.	.	.	.	.	10-11
Sec. A. Diseases of Ear, etc.	} 11-12	Clinical Surgery	.	.	.	.	12-2
" B. Diseases of Skin							
" C. Diseases of Eye							
Mental Diseases (twice weekly)	.	.	.	.	.	.	3-4
Infectious Diseases (if not previously attended)	} .	.	.	.	.	.	Afternoon
Dispensary Practice							
Practical Midwifery							

Summer Term—

Operative Surgery	.	.	.	.	.	.	8-9.45
Public Health	.	.	.	.	.	.	10-11
Sec. A. Diseases of Children	.	.	.	.	.	.	11-1
" B. Diseases of Ear, etc.	} 11-12	Clinical Medicine	.	.	.	.	12-1.30
" C. Diseases of Skin							
Forensic Medicine	.	.	.	.	.	.	2-3
Infectious Diseases (if not previously attended)	.	.	.	.	.	.	Afternoon

(Examination in Forensic Medicine and Public Health.)

* These classes are held thrice weekly, and on remaining days students must attend Clinical Surgery at 11 o'clock.

¹ A course of instruction is given in each term.

² Optional courses are held in the subjects of *History of Medicine* (during the First Term of the Winter Session, twice weekly, 4 to 5 p.m., and may be attended by students who have passed the 1st Professional Examination); *Physical Methods in the Treatment of Disease* (during the First Term of the Winter Session, 4 to 5 p.m., twice weekly, and open to students who have passed the 3rd Professional Examination); *Neurology* (daily at 4 p.m. during the Second Term of the Winter Session, and open to students who have passed the 3rd Professional Examination); *Applied Anatomy* (thrice weekly, from 5 to 6 p.m. during First Term of Winter Session, and students are recommended to take the class in the Fifth Winter).

Fifth Year.

Winter (1st Term)—

	Hour of Meeting of Class.
Clinical Gynecology	10-11
Sec. B. Diseases of Children	11-1
" A. Diseases of Eye 11-12 Clinical Medicine	12-1.30
" C. Clinical Medicine or Clinical Surgery.	
Dispensary Practice }	Afternoon
Practical Midwifery }	
Optional Classes.	

Winter (2nd Term)—

Clinical Gynecology	10-11
Sec. C. Diseases of Children	11-1
Secs. A. and B. Clinical Medicine or Clinical Surgery	12-1.30
Dispensary Practice } if not previously attended	Afternoon
Practical Midwifery }	

Summer Term—

Clinical Work in Hospital.

(Examination in Midwifery, including Gynecology, Surgery, and Medicine, and corresponding Clinical Examinations.)

FOR STUDENTS BEGINNING IN WINTER.

First Year.

Winter (1st Term)—

Practical Chemistry (twice weekly)	9-11
Anatomy	11-12
Chemistry	12-1
Physics	1-2
Practical Anatomy (thrice weekly)	Afternoon

Winter (2nd Term)—

Practical Chemistry (twice weekly)	9-11
Anatomy	11-12
Chemistry	12-1
Physics	1-2
Practical Anatomy (thrice weekly)	Afternoon

(Examination in Chemistry and Physics.)

Summer Term—

Botany	8-9
Zoology	12-1
Practical Botany } On alternate days {	9-11
Practical Zoology }	10-12
Practical Anatomy	Afternoon

(Examination in Botany and Zoology.)

Second Year.

Winter (1st Term)—

Physiology	10-11
Practical Physiology (twice weekly)	11-1
Practical Anatomy.	

Winter (2nd Term)—

Physiology	10-11
Practical Physiology	11-1
Practical Anatomy and Demonstrations.	

*Summer Term—*Hour of Meeting
of Class.

Histology	8-10 or 11-1
Practical Materia Medica.	
Practical Anatomy and Demonstrations.	
<i>(Examination in Anatomy and Physiology.)</i>	

Third Year.*Winter (1st Term)—*

Medicine	9-10
Pathology (Morbid Anatomy)	10-11
Clinical Medicine	11-1
Materia Medica	2-3
Pathology (including Elementary Bacteriology)	3-4

Winter (2nd Term)—

Medicine	9-10
Pathology (Morbid Anatomy)	10-11
Clinical Medicine	12-1.30
Materia Medica	2-3
Pathology (including Elementary Bacteriology)	3-4

Summer Term—

Pathology (Practical) (thrice weekly)	8-10
Pathology (Morbid Anatomy)	10-11
Clinical Surgery	12-2
Practical Materia Medica (if not previously attended).	
Vaccination	3-4

*(Examination in Pathology and Materia Medica.)***Fourth Year.***Winter (1st Term)—*

Surgery	:	:	:	9-10
Midwifery (including Gynecology)	:	:	:	10-11
Sec. A. Diseases of Skin	}	11-12	Clinical Surgery	12-2
„ B. Diseases of Eye				
„ C. Diseases of Ear, etc.				
Dispensary Practice	}			Afternoon
Infectious Diseases (once weekly)				
Anæsthetics.				
Optional Classes.				

Winter (2nd Term)—

Surgery				9-10
Midwifery (including Gynecology)	:	:	:	10-11
Sec. A. Diseases of Ear, etc.	}	11-12	Clinical Surgery	12-2
„ B. Diseases of Skin				
„ C. Diseases of Eye				
Mental Diseases (twice weekly)				3-4
Infectious Diseases (if not previously attended)	}			Afternoon
Dispensary Practice				
Practical Midwifery				

Summer Term—

Operative Surgery					8-9.45
Public Health					10-11
Sec. A. Diseases of Children					11-1
„ B. Diseases of Ear, etc.	11-12	Clinical Medicine .			12-1.30
„ C. Diseases of Skin					
Forensic Medicine					2-3
Infectious Diseases (if not previously attended)					Afternoon

(Examination in Forensic Medicine and Public Health.)

Fifth Year.

Winter (1st Term)—

	Hour of Meeting of Class.
Clinical Gynecology	10-11
Sec. B. Diseases of Children	11-1
„ A. Diseases of Eye 11-12. Clinical Medicine	12-1.30
„ C. Clinical Medicine or Clinical Surgery.	
Dispensary Practice)	Afternoon
Practical Midwifery)	
Optional Classes	

Winter (2nd Term)—

Clinical Gynecology	10-11
Sec. C. Diseases of Children	11-1
Secs. A. and B. Clinical Medicine or Clinical Surgery	12-1.30
Dispensary Practice) if not previously attended	Afternoon
Practical Midwifery)	

Summer Term—

Clinical Work in Hospital.

(Examination in Midwifery, including Gynecology, Surgery, and Medicine, and corresponding Clinical Examinations.)

The candidate must attend Hospital for not less than three years; must attend both Clinical Medicine and Clinical Surgery for a period of at least nine months; twenty cases of Midwifery, or twelve cases and three months' attendance at a Maternity Hospital; and Post-Mortem Examinations for three months.

It is required that, before commencing the study of Practical Midwifery, every student shall have held the offices of Clinical Medical Clerk and Surgical Dresser, and have attended a Course of Lectures on Surgery and Midwifery.

Two of the five years of study must be spent at the University, and not less than eight of the compulsory subjects of study must be taken in the University.

The minimum expense of M.B. and Ch.B., including fees for Classes, Hospital, Matriculation and Examination, amounts to about £143.

DEGREE OF M.D.

Each candidate for this degree who began medical study after 1st October 1892 must be of the age of twenty-four years or upwards, and must have obtained the degrees of M.B. and Ch.B. of the University. He must either have been engaged for two years in general practice, or for one year in the naval or military medical services, or in the medical wards of a hospital, or in scientific research. He must present a thesis written by himself on a medical subject, and pass an examination in Clinical Medicine. In this examination the candidate has to write a report and commentary on at least three cases, and has to show a practical knowledge in the application of the ophthalmoscope, laryngoscope, electrical apparatus, and sphygmograph, in the examination of the blood, and in the chemical and microscopical examination of the excreta.

The candidate who has graduated M.B. and Ch.B. under the old regulations may either proceed to the degree of M.D. under the old regulations (under which he is not required to pass an examination in Clinical Medicine, but must have passed examinations in Greek and in Logic or Moral Philosophy), or he may proceed to the degree as if he had graduated M.B., Ch.B. under the New Regulations.

DEGREE OF CH.M.

Each candidate must be not less than twenty-four years of age, must possess the degrees of M.B., Ch.B., must have attended the surgical wards of a hospital for one year, or have spent one year in scientific research or in the naval or military medical services, or two years in practice other than that restricted to medicine. He must submit a thesis on a surgical subject, and pass an examination on Clinical Surgery and its branches, Surgical Anatomy, and Operations on the Dead Body.

FEES FOR M.D. AND CH.M.

The fee for the M.D. degree under the old regulations is five guineas ; for the M.D. or Ch.M., under the New Regulations, ten guineas. The candidate must have paid the matriculation fee for the year in which he presents himself for examination or graduation. At each reappearance for examination, under the New Regulations, the fee is five guineas.

DEGREES IN PUBLIC HEALTH.

Two degrees are granted by the University of Edinburgh in the department of Sanitary Science, viz. B.Sc. and D.Sc.

BACHELOR OF SCIENCE.

Candidates must be graduates in Medicine of a University of the United Kingdom or of some other recognised University. In order to obtain the degree two examinations have to be passed.

First Examination.—Before entering for this examination the candidate must, after graduating in Medicine, have worked in a recognised Public Health Laboratory for eight months, of which five consecutive months must be passed in the Public Health Laboratory of the University of Edinburgh.

He must also have attended in a Scottish University a course of lectures on Physics and a course of lectures on Geology, extending over three months, and approved of by the University Court.

The subjects of examination are as follows :—

- (1) *Laboratory work*—Practical, written and oral ; examination of water, air, foods, beverages, condiments, sewage ; soils ; disinfectants ; building materials ; clothing ; bacteriology.
- (2) *Physics.* (3) *Geology.*

Second Examination.—This cannot be taken until eighteen months after graduating in medicine ; nor sooner than six months after passing the First B.Sc. Examination. The candidate must have attended two separate courses on Public Health, either in the University of Edinburgh or in some other recognised University or School.

Each course must consist of forty lectures, and include Medicine in its relation to Public Health and Sanitary Engineering.

The candidate must likewise produce evidence that (1) for six months he has studied sanitary work under a Medical Officer of Health for a county or burgh of not less than 25,000 inhabitants ; (2) that he has studied clinically for three months infectious diseases in a recognised institution ; (3) that for three months he has been instructed by a recognised teacher in mensuration and drawing.

The subjects of examination are :—

- (1) Sanitation ; (2) Sanitary Law ; (3) Vital Statistics ; (4) Medicine in Relation to Public Health.

The candidate is examined orally, practically, and by a written paper. *Sanitation* includes making reports on dwellings, workshops, hospitals and sanitary schemes.

The University Court may modify the work and instruction prescribed from time to time.

DOCTOR OF SCIENCE.

A graduate after having held the degree of B.Sc. for five years may present himself for the D.Sc. He must present a thesis or a published work or memoirs, the result of his own research, and must pass an examination in Public Health, and in such of its special subjects as the Senatus may determine. The candidate must submit the subject in which he proposes to be examined for approval not less than two months before the examination.

FEES PAYABLE.—First and second examinations, £3, 3s. each ; for D.Sc., £10, 10s.

INSTITUTIONS FOR CLINICAL INSTRUCTION IN EDINBURGH.

Royal Infirmary. 921 beds and 42 cots. Fees—perpetual ticket, £12 ; one year, £6, 6s. ; six months, £4, 4s. ; three months, £2, 2s. (Clinical instruction is given daily in Medicine, Surgery, and all their special branches.

Royal Hospital for Sick Children. 120 beds. Hospital ticket, £1, 1s. Fee for Qualifying Course, £2, 2s.

City Hospital for Infectious Diseases. 600 beds. Fee, £1, 1s.

Royal Maternity and Simpson Memorial Hospital. 40 beds. The Maternity Residency affords accommodation for twelve students.

Royal Asylum, Morningside. 500 beds.

The fee for a qualifying course at each of these last two institutions is £2, 2s.

Royal Victoria Hospital for Consumption and Diseases of the Chest. 50 beds. Out-Patient Department at Spittal Street.

Eye, Ear and Throat Infirmary. 6 beds ; 2700 Out-Patients yearly. Fee for three months, £1, 1s.

Royal, New Town, Medical Missionary (Cowgate), Western, Provident (Marshall Street), Eye, and Skin Dispensaries.

PROFESSORS AND LECTURERS IN EDINBURGH.

The Courses given by the Extra-Mural Lecturers are recognised by the University and other examining boards as qualifying for graduation.

Botany— Professor Bayley Balfour, M.D., Botanical Gardens.
James A. Terras, B.Sc., New School.

Zoology— Professor J. Cossar Ewart, M.D., University.
Malcolm Laurie, D.Sc., Surgeons' Hall.
Marion I. Newbigin, D.Sc., Surgeons' Hall.
Hugh Miller, F.Z.S., 29 George Square.

Biology— Malcolm Laurie, D.Sc., Surgeons' Hall.
Marion I. Newbigin, D.Sc., Surgeons' Hall.
C. R. Whittaker, F.R.C.S., New School.

Physics— Professor C. G. Barkla, D.Sc., University.
C. G. Knott, D.Sc., University.
Dawson Turner, M.D., Surgeons' Hall.
A. McKendrick, F.R.C.S., New School.

Chemistry— Professor Walker, University.
G. H. Gemmell, F.I.C., 4 Lindsay Place.
T. W. Drinkwater, Ph.D., Surgeons' Hall.

Anatomy— Professor A. Robinson, M.D., University.
J. Ryland Whitaker, M.B., Surgeons' Hall.

Applied Anatomy—
H. J. Stiles, M.B., University.
J. Ryland Whitaker, M.B., Surgeons' Hall.

Physiology— Professor Sir E. A. Schäfer, LL.D., University.
Alexander Goodall, M.D., Surgeons' Hall.

Materia Medica and Therapeutics—

Professor Sir Thomas R. Fraser, M.D., University.
William Craig, M.D., Surgeons' Hall.
John Orr, M.D., New School.

Pathology— Professor Lorrain Smith, M.D., University.
James Miller, M.D., Surgeons' Hall.

Surgery— Professor Alexis Thomson, University.
A. A. Scot Skirving, C.M.G., F.R.C.S., 27 Nicolson Square.
G. L. Chiene, F.R.C.S., New School.
Henry Wade, F.R.C.S., Surgeons' Hall.
J. W. Struthers, F.R.C.S., New School.
W. J. Stuart, F.R.C.S., 59 Forrest Road.
Lewis Beesly, F.R.C.S., Surgeons' Hall.

Clinical Surgery—

The Surgeons of the Royal Infirmary.
Professor F. M. Caird.
Professor Alexis Thomson.
C. W. Cathcart.
J. W. B. Hodsdon.
David Wallace.
Alexander Miles.
John W. Dowden.
And Assistant Surgeons.

Practice of Medicine—

Professor G. Lovell Gulland, M.D., University.
Harry Rainy, M.D., 27 Nicolson Square.
R. A. Fleming, M.D., Surgeons' Hall.
A. Dingwall Fordyce, M.D., Dental Hospital.
W. T. Ritchie, M.D., Surgeons' Hall.

Clinical Medicine—

The Physicians of the Royal Infirmary.
Professor Sir Thomas R. Fraser.
Professor G. Lovell Gulland.
Professor Wm. Russell.
Sir R. W. Philip.
Dr. Graham Brown.
Dr. F. D. Boyd.
Dr. R. A. Fleming.
Dr. Harry Rainy.
And Assistant Physicians.

Midwifery and Gynaecology—

Professor Sir J. Halliday Croom, M.D., University.
D. Berry Hart, M.D., Surgeons' Hall.
J. W. Ballantyne, M.D., Surgeons' Hall.
A. H. F. Barbour, M.D., University and Royal Infirmary.
J. Haig Ferguson, M.D., New School.
N. T. Brewis, F.R.C.S., Royal Infirmary.
E. M. Inglis, M.B.
John McGibbon, M.B., 59 Forrest Road.
G. F. B. Simpson, M.D., New School.
H. S. Davidson, F.R.C.S., Nicolson Square.

Insanity—

G. M. Robertson, M.D., University and Royal Asylum.
John Keay, M.D., Surgeons' Hall and Bangour Village Asylum.

Diseases of the Eye—

W. G. Sym, M.D., Royal Infirmary.
J. V. Paterson, M.B., Royal Infirmary.
A. H. H. Sinclair, M.D. (Ophthalmoscopy), 45 Lauriston Place.

*Vaccination—*W. G. Aitchison Robertson, M.D., D.Sc., Royal Dispensary.
W. D. D. Small, M.B., Provident Dispensary.

Diseases of Children—

John Thomson, M.D.
H. J. Stiles, M.B.
J. S. Fowler, M.D.
J. W. Simpson, M.D.

Diseases of the Skin—

Norman Walker, M.D., Royal Infirmary.
Frederick Gardiner, M.D., Surgeons' Hall.

Diseases of the Ear, Nose, and Throat—

A. Logan Turner, M.D., Royal Infirmary.
J. Malcolm Farquharson, M.B., Royal Infirmary.
J. S. Fraser, M.B., Surgeons' Hall.

Forensic Medicine—

Professor Harvey Littlejohn, F.R.C.S., University.
W. G. Aitchison Robertson, M.D., D.Sc., Surgeons' Hall.

Public Health—

Professor C. Hunter Stewart, M.B., University.
W. G. Aitchison Robertson, M.D., D.Sc., Surgeons' Hall.
Wm. Robertson, M.D., Surgeons' Hall.

Fevers—

Alexander James, M.D., City Hospital.
C. B. Ker, M.D., City Hospital.

Bacteriology—

Professor James Ritchie, M.D., University.
J. Taylor Grant, M.D., 4 Lindsay Place.
James Miller, M.D., Surgeons' Hall.

Diseases of Tropical Climates—

Major D. G. Marshall, I.M.S., University and Surgeons' Hall.

Practical Medicine and Physical Diagnosis—

Alexander Goodall, M.D., Surgeons' Hall.
R. A. Fleming, M.D., Nicolson Square.
J. D. Comrie, M.D., 59 Forrest Road.

Neurology— J. J. Graham Brown, M.D., University.

Physical Methods in the Treatment of Disease—

Harry Rainy, M.D., University.

Diseases of the Chest—

Sir R. W. Philip, M.D., Royal Victoria Hospital.

Medical Electricity and Röntgen Rays—

Dawson Turner, M.D., Surgeons' Hall.

Practical Anæsthetics—

J. Stuart Ross, M.B., University.

History of Medicine—

J. D. Comrie, M.D., University.

MEDICAL EDUCATION OF WOMEN IN EDINBURGH.

SCHOOL OF MEDICINE FOR WOMEN, SURGEONS' HALL.

The courses of instruction given in this School qualify for graduation in Medicine, and a large increase in the number of students has occurred in the last two years. The curriculum and class fees are the same as for male students proceeding to the University Degree or College Qualification respectively. Clinical tuition is provided in the Royal Infirmary, Sick Children's Hospital, the Royal Maternity Hospital, Bangour Asylum, and the City Hospital.

A sitting-room is provided for the students. A lady secretary is in daily attendance at the office, and the services of lady demonstrators of anatomy and physiology are available. A prospectus, containing particulars of the curriculum, halls of residence, students' societies, etc., may be had on application to Miss Keith, Secretary, Surgeons' Hall.

UNIVERSITY OF GLASGOW.

DEGREE OF M.B. AND CH.B.

Within recent years the facilities for both scientific and practical training have been much extended and improved. New and fully equipped laboratories have been added in connection with nearly all the scientific subjects, the most recent addition being a large building, completed at a cost of £40,000, for the departments of Physiology, Materia Medica, and Public Health. There is a large and well-equipped Pathological Institute at the Western Infirmary in which the University Classrooms are placed, and the Professor of Pathology is *ex officio* Pathologist to the Infirmary, and has control of all the pathological material for purposes of instruction and investigation. A corresponding arrangement forms part of the new scheme recently completed with regard to the Royal Infirmary. The Western Infirmary is close to the University, and has hitherto been the chief field of clinical instruction of University students. A scheme has, however, been carried through, according to which University Chairs, on the same footing as those already in existence, have been instituted at the Royal Infirmary in the subjects of Pathology, Medicine, Surgery, Midwifery, and Gynecology. Students accordingly have the option of taking the subjects of the two final years of study at the Royal Infirmary, and in this way the advantage is afforded of a very wide clinical field along with systematic instruction under University Professors. The great disadvantage of attending classes at Gilmorehill and going to the Royal Infirmary, at a considerable distance, for clinical work is thus done away with.

The latest development is the institution, at the Western Infirmary, of a Laboratory for Clinical Pathology, the Director of which is also a University Lecturer, and gives instruction to University students in the scientific methods of clinical diagnosis.

Under the New Ordinance of the University Court, which came into operation on 1st October 1911, the regulations for these Degrees (except in regard to the Preliminary Examination) have been considerably altered, the chief modifications being as follows:—1. A rearrangement of the subjects of the four Professional Examinations. 2. The rendering compulsory of some courses which hitherto have been optional. 3. The imposition of restrictions as to the period at which certain subjects of the curriculum can be taken.

The academical year is now divided into three terms of about ten teaching weeks each, and the following list gives the subjects of the several Professional Examinations, with the period of study required:—

FIRST EXAMINATION.

Chemistry (including Organic Chemistry), 2 terms; with Practical Chemistry, 1 term.

Physics (with practical work), 1 term.

Botany (with practical work), 1 term.

Zoology (with practical work), 1 term.

SECOND EXAMINATION.

Anatomy and Practical Anatomy, 5 terms.
Physiology and Practical Physiology, 3 terms.

THIRD EXAMINATION.

Materia Medica and Therapeutics, 2 terms.
Pathology and Practical Pathology, 3 terms.

FOURTH EXAMINATION.

Medical Jurisprudence and Public Health, 2 terms.
Surgery, 2 terms.
Practice of Medicine, 2 terms.
Midwifery and Diseases Peculiar to Women and Infants, 2 terms.

The candidate must have attended the Medical and Surgical practice of a general hospital for three years, and courses of Clinical Surgery and Clinical Medicine of nine months in each case. He must also have received instruction, under conditions laid down, in the following subjects :—

Mental Diseases.
Practical Pharmacy.
Out-Patient Practice.
Clinical Clerking in Medicine.
Clinical Clerking or Dressing in Surgery.
Post-Mortem Examinations.
Infectious Diseases.
Gynæcology.
Diseases of Children.
Ophthalmology.
Diseases of the Ear and Throat.
Dermatology.
Practical Midwifery with the Conduct of Cases of Labour.
Vaccination.
Administration of Anæsthetics.
Operative Surgery.

The following courses cannot be taken till after the end of the terms of the curriculum indicated in each case :—

Physiology and Practical Physiology—third term, and not (except Practical Histology) till at least three of the subjects of the First Examination have been passed.

Materia Medica and Therapeutics, and Pathology and Practical Pathology—sixth term.

Medical Jurisprudence and Public Health—eighth term.

Midwifery, etc., Surgery and Medicine—ninth term, with the exception that Surgery may be attended after the sixth term, provided that the candidate has passed the Second Professional Examination.

Hospital Practice, Clinical Medicine, Clinical Surgery—sixth term.

The curriculum extends over five years, two of which must be spent in the University of Glasgow. The remaining three years may be spent elsewhere, as indicated in the Ordinance and under the conditions thereby imposed.

Except in the case of Medicine, Surgery, and Midwifery, the Senate may accept the Professional Examinations of other Scottish Universities.

There are a number of other administrative regulations which need not here be specified in detail.

The examination fees are £23, 2s. in all, with an additional fee of £1, 1s. for every re-entry. The cost of the curriculum amounts roughly to £145, spread over the five years of the course, and at present the class fees are charged at so much a class. There is, however, a movement on foot to introduce a "composition" or "inclusive" fee per session, but the total will work out at practically the above figure.

CLINICAL FACILITIES.

The following general hospitals, all of which are equipped in a modern fashion, are available for instruction of University students, viz. the Western Infirmary close to the University, the Royal Infirmary, to which the new Medical Chairs are attached, each of these having at present about 600 beds, and the Victoria Infirmary, with 260 beds, on the south side of the city.

The Eye Infirmary at 174 Berkeley Street and 80 Charlotte Street (between them 100 beds), and the Ophthalmic Institution at 126 West Regent Street (35 beds), furnish ample opportunities for instruction in the important branch with which they deal; Insanity is equally well provided for at Gartnavel (460 beds), at Hawkhead (700 beds), at Gartloch (806 beds), and at Woodilee (1160 beds), while the City Fever Hospitals at Ruchill (540 beds) and Belvidere (680 beds) are available for the study of Zymotic Diseases. The Ear, the Throat and Nose, and the Skin are dealt with in the Western and Royal Infirmarys.

A new Maternity Hospital, with every modern convenience and equipment, was recently opened in Rottenrow, with accommodation for 104 patients, and a Hospital for Sick Children, of greatly increased dimensions, in freer air, has been erected at Yorkhill within a short distance of the University. The beds number 200.

The Ordinance is applicable alike to men and women students, and much of the instruction is given in "mixed" classes by the Professors. There are, however, exceptions to this, some classes for women alone being held in a separate building (Queen Margaret College), and some for both sexes (in the main buildings at Gilmohrhill) at different hours. The Hospital work in the case of women has hitherto been taken entirely in the Royal Infirmary, there being no accommodation for them in the Western. This arrangement is likely to continue.

PROFESSORS.

- Zoology*— Professor Graham Kerr, M.A., F.R.S.
Chemistry— Professor Ferguson, M.A., LL.D., F.S.A.
Practical Physics— Professor Gray, M.A., LL.D., F.R.S.
Botany— Professor Bower, Sc.D., F.R.S.
Anatomy— Professor Bryce, M.A., M.D.
Physiology— Professor Noël Paton, B.Sc., M.D., F.R.S.
Materia Medica and Therapeutics— Professor Stockman, M.D.
Pathology— Professor Muir, M.A., M.D., F.R.S.
Medical Jurisprudence and Public Health— Professor Glaister, M.D., D.P.H.(Camb.).
Surgery and Clinical Surgery— Professor Sir William Macewen, M.D., LL.D., D.Sc., F.R.S.
Midwifery— Professor Murdoch Cameron, M.D.
Practice of Medicine and Clinical Medicine— Professor T. Kirkpatrick Mouro, M.A., M.D.
Public Health— Professor Glaister, M.D., D.P.H.(Camb.).
Pathology— Professor John H. Teacher, M.A., M.D.
Medicine and Clinical Medicine— Professor Walter K. Hunter, D.Sc., M.D.

Surgery and Clinical Surgery—

Professor Robert Kennedy, M.A., D.Sc., M.D.

Midwifery—

Professor John M. Munro Kerr, M.D.

LECTURERS.

Organic Chemistry—

T. S. Patterson, Ph.D., D.Sc.

Physiological Chemistry—(Vacant).*Psychological Physiology—*

Henry J. Watt, M.A., Ph.D., D.Phil.

Ear—

Thomas Barr, M.D., and J. Kerr Love, M.D.

Throat and Nose—

James Walker Downie, M.B., and J. Macintyre, M.B.

Skin—

John Wyllie Nicol, M.B., and G. McIntyre, M.B.

Clinical Pathology—

John Shaw Dunn, M.A., M.D.

Bacteriology—

W. B. M. Martin, M.D.

Pathological Histology—

G. Haswell Wilson, M.B., Ch.B.

Physics—

James G. Gray, D.Sc.

Embryology—

James F. Gemmill, M.A., D.Sc., M.D.

Lsanuity—

Landel R. Oswald, M.B., and J. H. Macdonald, M.B.

DEAN.

Professor T. H. Bryce, M.A., M.D.

DEGREE OF M.D.

This degree is open to holders of the M.B., Ch.B. diploma, after a period of one or two years, according to circumstances, has elapsed since the date of the latter. The requirements are (*a*) an Examination in Clinical Medicine, or in some approved department of Medical Science or Practice; (*b*) a Thesis on any branch of knowledge comprised in the examinations for M.B., Ch.B., excepting a subject which is exclusively surgical; and (*c*) a fee of £15, 15s., with an extra charge of £5, 5s. for each re-entry.

DEGREE OF CH.M.

This may be obtained on practically the same terms as the M.D. degree, the only differences being (1) that the examination is on Surgical Anatomy, operations upon the dead body, on Clinical Surgery or an approved special department of Surgery, and (2) that the Thesis must not be on a subject which is exclusively medical.

DEGREE OF B.Sc. IN PUBLIC HEALTH.

Candidates must be graduates in Medicine of a University in the United Kingdom or of some other University recognised for the purpose by the Glasgow University Court, and they must thereafter have received practical instruction, including instruction in Chemistry, Bacteriology, and the Pathology of the Diseases of Animals transmissible to man, for at least twenty hours per week during a minimum period of eight months, five consecutive months of which must be in the Public Health Laboratory of the University of Glasgow. Either before or after graduation in Medicine they must also have

attended, in the University of Glasgow or elsewhere, courses of Physics and Geology, and after graduation two separate courses in Public Health (Medicine and Engineering), as well as practically studying sanitary work for six months under a Medical Officer of Health in the United Kingdom, or a Sanitary Staff Officer of Health of the Royal Army Medical Corps, besides attending three months' practice of a Hospital for Infectious Diseases, where methods of administration can be studied, and three months in Mensuration and Drawing. The examinations are, *First*, Public Health, Laboratory Work, Physics, and Geology; *Second*, Sanitation, Sanitary Law, Vital Statistics, and Medicine in its bearings on Public Health. The examination fee is £6, 6s.

DEGREE OF D.Sc. IN PUBLIC HEALTH.

Five years after obtaining the B.Sc. degree, graduates may proceed to the higher Degree of D.Sc., the requirements being (*a*) a Thesis or a published memoir or work to be approved by the Senate; and (*b*) an examination in Public Health and in such of its special departments as the Senate and University Court may determine. The fee for this degree is £10, 10s.

QUEEN MARGARET COLLEGE FOR WOMEN.

A full course of Medicine and Surgery is obtainable partly at Queen Margaret College, but in recent years the tendency has been to have mixed classes at Gilmorehill. The regulations, fees, etc., are similar to those for men. The buildings are pleasantly situated in grounds of their own, close to the Botanic Gardens. The anatomical department is excellently arranged and most complete. Clinical work is amply provided for in the Royal Infirmary and its Dispensaries, and in the Royal Hospital for Sick Children, the Glasgow Maternity Hospital, the Royal Asylum of Gartnavel, and the Belvidere Fever Hospital. There are also arrangements for special study and research.

Students can have board and lodging at Queen Margaret Hall, within easy reach of the College, at the rate of about one guinea per week.

All information necessary can be obtained from Miss Melville, Queen Margaret College, Glasgow.

ST. MUNGO'S COLLEGE.

This, the Medical School of the Royal Infirmary, the largest hospital in Glasgow, is situated in Cathedral Square, Castle Street, and has car communication with every part of the city. St. Mungo's College is in the Infirmary grounds.

The Infirmary has, including the Ophthalmic Department, over 620 beds, the average number occupied in 1912 being 620. When the reconstruction of the Infirmary, long in progress, is completed, it will have about 700 beds. There are special beds and wards for Diseases of Women, of the Throat, Nose and Ear, Venereal Diseases, Burns, and Septic Cases.

At the Outdoor Department the attendances in 1905 numbered over 62,000. In addition to the large Medical and Surgical Departments, there are Departments for Special Diseases—namely, Diseases of Women, of the Throat and Nose, of the Ear, of the Eye, of the Skin, and of the Teeth. A fully-equipped Electrical Pavilion was opened a few years ago, and year by year the latest and most approved apparatus for diagnosis and treatment has been added. Wards are set apart for the teaching of women students.

Appointments.—Five House-Physicians and nine House-Surgeons, having a legal qualification in Medicine and Surgery, who board in the Hospital free of charge, are appointed every six months. Clerks and Dressers are appointed by the Physicians and Surgeons. As a large number of cases of acute diseases and accidents of a varied character are received, these appointments are very valuable and desirable.

Fees.—The fees for hospital attendance, including Clinical Lectures and

Tutorial Instruction, attendance at the Outdoor Department, at the Pathological Department, Post-Mortem Examinations, and the use of the Museum, which has not long since been rearranged and catalogued, are as follows:—For one year, £10, 10s.; for six months, £6, 6s.; for three months, £4, 4s. Students who have paid fees to the amount of £21 to the Glasgow Royal Infirmary are permitted to attend, in any subsequent year or years, one Winter and one Summer Course of Instruction in the Infirmary without further payment; and students who have paid to any other hospital in the United Kingdom fees, being not less than £21, in virtue of which they are entitled to attend without further payment, shall be admitted as students of the Royal Infirmary on payment of £3, 3s. for six months, or £1, 11s. 6d. for three months.

THE ANDERSON COLLEGE OF MEDICINE,

DUMBARTON ROAD, PARTICK, GLASGOW.

The old Institution known as "Anderson's University" was founded by the will of John Anderson, M.A., F.R.S., in 1795, and the medical school connected therewith dates back to the year 1799.

In 1877 the name of the Institution was altered from "Anderson's University" to "Anderson's College." In 1887 the medical school of Anderson's College became a distinct Institution known as "Anderson's College Medical School."

The new buildings are situated in Dumbarton Road, immediately to the west of the entrance to the Western Infirmary and four minutes' walk from the University. They are constructed on the best modern principles, and are provided with all the appliances requisite for the conduct and management of a fully-equipped medical school.

Classes are conducted in all the subjects of the five years' curriculum:—

Anatomy—Vacant.

Physics—Professor Peter Bennett.

Chemistry—Professor J. Robertson Watson, M.A.

Botany—Professor B. G. Cornack, M.A., B.Sc.

Zoology—Professor W. Ferguson Mackenzie, M.B.

Physiology—Professor Hugh Morton, M.D.

Materia Medica—Professor J. P. Duncan, M.B., B.Sc.

Medical Jurisprudence—Professor Carstairs Douglas, D.Sc., M.D., F.R.S.E.

Midwifery—Professor W. D. Macfarlane, M.B., C.M.

Surgery—Professor Archibald Young, B.Sc., M.B.

Practice of Medicine—Professor John Cowan, B.A., D.Sc., M.D.

Ophthalmic Medicine and Surgery—A. J. Ballantyne, M.D.

Aural Surgery—James Galbraith Connal, M.D.

Diseases of Throat and Nose—John Macintyre, M.B., F.R.S.E.

Mental Diseases—Ivy Mackenzie, M.A., B.Sc., M.D.

Public Health Laboratory—Professor Carstairs Douglas, D.Sc., M.D., F.R.S.E.

Pathology—At the Western or Royal Infirmary.

Diseases of the Skin—J. Goodwin Tomkinson, M.D.

Dental Anatomy and Physiology—W. Wallace, M.A., M.D., L.D.S.

Dental Surgery and Pathology—John Watt, L.R.C.P., L.D.S.

Dental Metallurgy—Chas. Read, L.D.S.

Dental Bacteriology—Professor Carstairs Douglas, M.D., D.Sc., F.R.S.E.

Degrees and Diplomas.—Certificates of attendance on the classes at Anderson's College Medical School are received by the Universities of London and Durham, by the Royal University of Ireland, and by all the Royal Colleges and Licensing Boards in the United Kingdom. They are also recognised by the Universities of Glasgow and Edinburgh under certain conditions which are stated in the Calendar of this school. The Public Health Laboratory Course is recognised as qualifying for the Diploma granted by the Universities of Oxford, London, and Cambridge, the Scottish Conjoint Board, and the Royal Irish Colleges.

Candidates for the Licence in Dental Surgery can obtain at this School the full medical and dental curriculum which is required. The clinical work special to dentistry is conducted at the Glasgow Dental School, 15 Dalhousie Street.

Malcolm Kerr Bursary in Anatomy. Value about £10. Open to students of the junior anatomy class during session 1907-1908.

The Carnegie Trust will pay the fees of students at Anderson's, on conditions regarding which particulars may be obtained from Sir W. S. McCormick, LL.D., Carnegie Trust Offices, Edinburgh.

Class Fees.—For each course of lectures (anatomy, ophthalmic medicine and surgery, aural surgery, diseases of throat and nose, mental diseases, and dental classes excepted): first session, £2, 2s.; second session (in Anderson's College), £1, 1s.; afterwards free. For practical classes (except anatomy), viz. chemistry, botany, zoology, physiology, pharmacy, operative surgery: first session, £2, 2s.; second session, £2, 2s.

Reduced joint fees in zoology and in botany, for lectures and practical class when taken in same summer session, £3, 3s.; for either course separately, £2, 2s.

Anatomy.—Winter—first session, lectures and practical anatomy, £5, 5s.; practical anatomy alone, £2, 2s.; second session, lectures and practical anatomy, £4, 4s.; practical anatomy, £2, 2s.; for summer fees, see Calendar.

Dental Classes.—£3, 3s. each.

ABERDEEN UNIVERSITY.

The course of study for the degree of M.B., Ch.B. extends over five years, of which two at least must be spent in the University of Aberdeen.

The curriculum is the same as in the other Scottish Universities as far as relates to attendance on University classes, to clinical study at a General Hospital, to attendance on courses of Clinical Surgery, Clinical Medicine, Mental Diseases, and Practical Pharmacy, Operative Surgery, Anæsthetics, to instruction in Vaccination, to attendance on Cases of Labour, and to the practice of a Dispensary.

The candidate must also, before admission to the final examination, produce the following certificates:—

1. That he has been present at not fewer than twenty-five post-mortem examinations, some of which he must have personally taken part in performing.

2. That he has attended a course of instruction in Infectious Diseases consisting of not fewer than ten meetings, in a Hospital for the treatment of such diseases containing at least a hundred beds.

3. That he has attended in a Hospital a course of instruction in Gynæcology consisting of not fewer than twenty meetings.

4. That he has attended in a special hospital a course of instruction in the Diseases of Children, consisting of not fewer than twenty meetings.

5. That he has attended in the Ophthalmological Department of a Hospital or Dispensary a course of instruction in Ophthalmology, consisting of not fewer than thirty meetings extending over one term.

6. That he has attended in a Public Hospital or Dispensary a course of instruction in Diseases of the Ear, Nose, and Throat, consisting of not fewer than twenty meetings.

7. That he has attended in a Public Hospital or Dispensary a course of instruction in Dermatology, consisting of not fewer than twenty meetings.

Certificates for these various classes and courses must attest not only regular attendance, but also due performance of the work.

There is no prescribed order of study, but a scheme, representing the minimum curriculum, has been drawn up for the guidance of students, and is printed in the Calendar.

THE FOLLOWING ARE THE CLASSES IN THE MEDICAL FACULTY:—

WINTER SESSION.

- Zoology*—Professor John Arthur Thomson, M.A., LL.D.
Chemistry (Syst. and Pract.)—Professor Frederick Soddy, M.A., F.R.S., and Assistants.
Anatomy—Professor Reid, M.D., F.R.C.S.
Practical Anatomy—Professor Reid and Assistants.
Physiology (Syst. and Pract.)—Professor MacWilliam, M.D.
Medicine—Professor Cash, M.D., LL.D., F.R.S.
Pathology (Syst. and Pract.)—Professor Theodore Shennan, M.D., F.R.C.S.E.
Public Health—Mr. John Parlane Kinloch, M.D., *Lecturer*.
Surgery—Professor John Marnoch, C.V.O., M.A., M.B., C.M.
Medicine—Professor Mackintosh, M.A., M.D.
Midwifery and Diseases of Women and Children—Professor R. G. McKerron, M.A., M.D.

SUMMER SESSION.

- Botany*—Professor Trail, M.A., M.D., F.R.S.
Practical Botany—Professor Trail.
Zoology—Professor Thomson.
Practical Zoology—Professor Thomson.
Physics—Professor Niven, M.A., D.Sc., F.R.S.
Practical Anatomy—Professor Reid and Assistants.
Practical Materia Medica and Pharmacy—Professor Cash and Assistants.
Physiology (Syst. and Pract.)—Professor MacWilliam.
Forensic Medicine—Professor Hay, M.D., LL.D.
Practical Hygiene and Forensic Medicine—Professor Hay.
Pathology (Syst. and Pract.)—Professor Shennan.
Practical Midwifery and Gynaecology and Clinical Diseases of Children—Professor McKerron.

Systematic and Practical Pathology, and Systematic and Practical Physiology respectively, are taught as part of one continuous course, occupying a whole academic year, *i.e.* a summer and a winter session.

There are Assistants to the Professors in the Medical Faculty appointed annually, three in the Department of Chemistry, two in the Departments of Anatomy, Physiology, Botany, Zoology, Pathology, and Materia Medica, and one in each of the other departments.

Clinical Medicine and Clinical Surgery are taught by the Physicians and Surgeons of the Royal Infirmary.

The following are recognised as Lecturers:—

Lecturer on Mental Diseases . . .	Wm. Reid, M.D.
„ Ophthalmology . . .	{ C. H. Usher, M.B., B.S., F.R.C.S.
„ Vaccination . . .	{ A. Rudolph Galloway, M.A., M.B., C.M.
„ Skin Diseases . . .	T. Fraser, M.A., M.B., Ch.B.
„ Diseases of Ear, Throat, and Nose . . .	{ J. F. Christie, M.A., M.B., C.M.
„ Medical Electricity . . .	{ J. Mackenzie Booth, M.D., C.M.
„ Anæsthetics . . .	{ H. Peterkin, M.B.
	{ J. R. Levack, M.B., C.M.
	{ Alex. Ogston, M.B., C.M.
	{ D. W. Geddie, M.B., C.M.

All the University Classes are held at Marischal College.

Tutorial Classes are held in connection with most of the Systematic Courses, and practical instruction is given in the fully-equipped Laboratories connected with the several departments.

Graduates or others desirous of engaging in special study or research may be allowed by the Senatus to work in any of the Laboratories on payment of the usual matriculation fee.

General clinical instruction is obtained in the following Medical Institutions :—

The Royal Infirmary of Aberdeen.

This General Hospital, situated about seven minutes' walk from Marischal College, has been recently constructed on the most modern principles, and is fully equipped with all the requirements for medical work and teaching. It accommodates upwards of 270 patients : the number of patients admitted during the year 1914 was 3242, and the number of out-patients treated during the same period was 15,214.

Six resident medical officers are appointed annually, three in May and three in September, to hold office for twelve months. Salary, £26, 5s. with board.

Fees.—Perpetual fee to hospital practice, £10, or first year, £5, 10s., second year, £5, afterwards free ; clerkship in medicine, £1, 1s. ; dressership in surgery, £1, 1s. ; pathological demonstrations, £2, 2s. (Special courses of lectures are charged for.)

The Royal Hospital for Sick Children.

Is situated about five minutes' walk from Marischal College, and accommodates over 80 patients. The number of patients admitted in 1914 was 888, and the number of out-patients treated was 2057. Each student must act as clerk for six weeks in the medical and surgical wards respectively.

There are two resident medical officers, senior and junior, who hold office for six months. Salary at the rate of £25 per annum in the case of the senior resident, and £20 per annum in the case of the junior resident.

Fee for hospital practice, £2, 2s. first year.

Note.—The above Hospital is temporarily removed to Kepplestone House.

The Royal Asylum.

Is about fifteen minutes' walk from Marischal College. It accommodates over 950 patients, and has been recently fitted up with a fully-equipped hospital and a laboratory.

The senior physician is recognised by the University as lecturer on mental diseases, and delivers a qualifying course of lectures.

The City (Fever) Hospital.

Is about ten minutes' walk from Marischal College, and accommodates 250 patients.

Senior students are admitted for instruction in fevers twice a week under the visiting physician (who is the Medical Officer of Health for the City) and his assistant. Fee, £1, 1s.

General Dispensary and Vaccine Institution.

This is about five minutes' walk from Marischal College.

The total number of cases treated during 1914 was 6088, and the number of patients treated at their own homes 1085.

Fees.—General practice, £3, 3s. ; vaccination certificate and instruction, £1, 1s.

Aberdeen Maternity Hospital.

This Institution is situated at the top of Castle Terrace, less than ten minutes' walk from Marischal College. Contains 18 beds. The number of patients treated in the hospital during 1914 was 203 and at their own homes 96—in all, 299. Fee, £3, 3s.

Ophthalmic Institution.

This Institution is situated about three minutes' walk from Marischal College. The surgeon in charge is recognised by the University as a lecturer on ophthalmology.

During 1914, 33 in-patients and 3080 out-patients were treated.

PROFESSIONAL EXAMINATIONS.

There are four examinations: the subjects and regulations of these are common to the Universities of Aberdeen and Glasgow.

DEGREE OF M.D.

The regulations with regard to the age and other qualifications of the candidate are similar to those in the other Scottish Universities. He must submit a thesis written by himself upon any medical subject, and pass an examination in Clinical Medicine or in some Special Department of Medical Science or Practice.

DEGREE OF CH.M.

Each candidate must be not less than twenty-four years of age, and must hold the degree of M.B., Ch.B. of the University. He must produce a certificate of having been engaged for at least one year in attendance in the surgical wards of a hospital, or in scientific research, or in the naval and military services, or for two years in practice other than practice restricted to medicine. He must present a thesis on a surgical subject and pass an examination on Clinical Surgery, Surgical Anatomy, and Operations on the Dead Body.

DIPLOMA IN PUBLIC HEALTH (D.P.H.)

The diploma is conferred, after special instruction and examination, on any one who has been at least twelve months a graduate in medicine of a University in the United Kingdom; if not a graduate of Aberdeen University, the candidate must attend a course of instruction in this University in one or more subjects embraced in the examination for the diploma.

Each candidate must have attended a course of instruction in Public Health.

The qualifying post-graduate instruction embraces—

- (a) Regular attendance, for three months, at a hospital for infectious diseases, at which opportunities are afforded for the study of methods of administration.
- (b) Daily association for a period of six months (of which at least three months must be distinct from the period of laboratory instruction) in the duty, routine and special, of Public Health Administration, under the supervision of a recognised Medical Officer of Health.
- (c) Practical instruction, for at least six months, in laboratory work, which includes examination of water, air, soil and foods, and the study of bacteriology, disinfection, ventilation, water supply and sewerage, and the framing of reports of analysis. The laboratory attendance must extend over at least fifteen hours a week.

The qualifying courses of laboratory instruction in Aberdeen University are given in the Public Health Laboratory (fee, £6, 6s.), and the Bacteriological Laboratory (fee, £4, 4s.).

Instruction in Public Health Administration is given by Professor Hay, Medical Officer of Health of the City of Aberdeen (fee, £6).

Instruction is given in the Drawing and Interpretation of Plans (fee, £1, 1s.).

A short course of lectures is given on Statistical Methods and their application to Public Health.

The diploma is conferred after an examination in March and July of each year.

The examination is written, oral and practical, and is divided into two parts.

Part I. embraces the following subjects in their application to Public Health :—

- (a) Physics, Engineering, and Meteorology.
- (b) Chemistry, Microscopy, and Bacteriology.

Part II. embraces—

- (a) General Hygiene.
- (b) Sanitary Law and Vital Statistics.

Part I. may be taken alone, or both parts together.

The written examinations occupy two days, and the oral and laboratory and outdoor examinations three to four days.

Candidates must send in their names and pay the fees a fortnight before the examination. Examination fee is five guineas. Re-examination fee one guinea.

FEES.

Arrangements have been made, in conjunction with the other Scottish Universities, for the institution of an inclusive fee for the courses of instruction leading to the M.B. and Ch.B. degrees. The inclusive fee for instruction within the walls of the University is ninety guineas, payable in five annual instalments.

The cost of matriculation, class and hospital fees for the whole curriculum, including the fees for the degrees, is usually about £160.

UNIVERSITY OF ST. ANDREWS.

The degrees conferred are Bachelor of Medicine and Bachelor of Surgery (M.B., Ch.B.), Doctor of Medicine (M.D.), and Master of Surgery (Ch.M.). The inclusive fee for the University instruction for M.B., Ch.B. is ninety guineas; and the inclusive fee for the clinical courses is forty guineas. These fees may be paid by annual instalments. For M.D. or Ch.M. the fee payable is fifteen guineas.

Two constituent colleges of the University provide medical teaching. The United College, St. Andrews, offers classes for two years, and the student may pass the first and second professional examinations at St. Andrews. There are excellent opportunities for combining degrees in Arts and Science with those of Medicine. Inclusive fees have been arranged for students who wish to take advantage of these opportunities. There are many bursaries offered to students who desire to graduate in Medicine, and it should be added that the cost of rooms and of living in St. Andrews is considerably less than in the larger University cities. For women there is an excellent residential hall, which is governed by the University authorities. The medical school is now carried on in buildings specially built for the purpose.

The Conjoint School of Medicine, Dundee, supplies a complete course of medical study, and the student from United College, St. Andrews, completes his curriculum there. Large new buildings with well-equipped laboratories have been provided. Both in the Medical School and the wards of the Dundee Royal Infirmary the students have unrivalled opportunities for gaining a practical knowledge of medical science and of medical work, for the students have individual attention and supervision which the larger schools cannot give.

The Dundee Royal Infirmary contains 400 beds, and includes special wards for obstetrics, gynecology, children's diseases, ophthalmology, dermatology, otology, incipient insanity, and electrical therapeutics. New out-patient departments are now in use. There is a large out-door maternity department. Hospital Fees—Surgical and Medical £3, 3s. yearly; Perpetual Ticket, £10, or in instalments, £10, 10s.; Obstetric Cases, £2, 2s.; Obstetric Clinic, £1, 1s.

Westgreen Asylum at Liff provides abundant material for instruction in

mental diseases, and the City Fever Hospital in fevers. The Dundee Eye Institution furnishes cases for instruction in ophthalmology.

The Diploma of Public Health (D.P.H.) may be taken at the Conjoint School of Medicine, Dundee.

All classes in the University are open to men and women alike.

UNITED COLLEGE, ST. ANDREWS.

PROFESSORS AND LECTURERS.

- Physics*— Professor Butler, M.A.
Chemistry— Professor Irvine, Ph.D., D.Sc.
Zoology— Professor M'Intosh, M.D., LL.D., F.R.S.
Botany— R. A. Robertson, M.A., B.Sc.
Physiology— Professor Herring, M.D.
Anatomy— Professor D. Waterston, M.D., F.R.C.S.
Regional Anatomy—
 D. R. Dow, M.B.

UNIVERSITY COLLEGE, DUNDEE.

PROFESSORS AND LECTURERS.

- Physics*— Professor Peddie, D.Sc.
Chemistry— Professor Mackenzie, D.Sc.
Zoology— Professor Thompson, M.A., D.Litt., C.B.
Botany— Professor Geddes, F.R.S.E.
Physiology— Professor Waymouth Reid, M.B., Sc.D., F.R.S.
Anatomy— Principal Mackay, M.D., LL.D.
 Lieut.-Col. Lamont, M.B., I.M.S. (retired).
Surgery— Professor MacEwan, M.D., C.M.
Surgery, Clinical—
 D. M. Greig, C.M., F.R.C.S.
 L. Turton Price, Ch.B., F.R.C.S.
Medicine— Professor Stalker, M.D.
Medicine, Clinical—
 Professor Stalker, M.D. ; J. Mackie Whyte, M.D.
Materia Medica—
 Professor C. R. Marshall, M.D.
Pathology— Professor Sutherland, M.B.
Midwifery and Gynecology—
 Professor Kynoch, M.B., F.R.C.P., F.R.C.S.
Midwifery and Gynecology, Clinical—
 Professor Kynoch, M.B.
 R. C. Buist, M.D.
Forensic Medicine—
 C. Templeman, M.D., D.Sc., M.O.H.
Ophthalmology—
 Angus MacGillivray, M.D., D.Sc.
Diseases of Ear, Nose, and Throat—
 R. P. Mathers, M.D.
Diseases of Children—
 D. M. Greig, C.M., F.R.C.S.
 J. S. Y. Rogers, M.B.

Diseases of Skin—

W. E. Foggie, M.D.

Mental Diseases—

W. Tuach Mackenzie, M.D.

Vaccination—

R. C. Buist, M.D.

Clinical Pathology—

F. M. Milne, M.B., D.P.H.

Clinical Medical Tutor—

Charles Kerr, M.B.

Clinical Surgical Tutor—

W. L. Robertson, Ch.B., F.R.C.S.

Anæsthetics—

A. Mills, M.D.

Dean of the Faculty of Medicine—

Professor Kynoch.

QUALIFICATIONS GIVEN BY THE SCOTTISH COLLEGES.

The Royal College of Physicians of Edinburgh, the Royal College of Surgeons of Edinburgh, and the Royal Faculty of Physicians and Surgeons of Glasgow, conjointly confer the Triple Qualification (L.R.C.P.E., L.R.C.S.E., L.R.F.P.S.G.). Female candidates are admitted to the examinations for this qualification.

PRELIMINARY EXAMINATION.—This examination must be passed before the student commences professional study. It may be passed before any of the Boards recognised by the General Medical Council, and enumerated in the Regulations of the Colleges. The Educational Institute of Scotland conducts a qualifying Preliminary examination for medical students, in Edinburgh and Glasgow, on behalf of the Colleges. This examination embraces English, Latin, Mathematics, and either Greek, French, German, Italian, or other modern language. All the subjects may be passed at one or not more than two times. Calendar, containing examination papers, can be had from Mr. Hugh Cameron, M.A., 34 North Bridge Street, Edinburgh. Price 1s.

PROFESSIONAL EDUCATION.—The curriculum must extend over five years. Graduates in Arts or Science of any recognised University who have spent a year in the study of Physics, Chemistry, and Biology, and have passed an examination in these subjects for the degrees in question, are exempted from the first year of study. The fifth year of study should be devoted to clinical work in one or more recognised Hospitals or Dispensaries, and to the study of special diseases. For information regarding the payment of class fees by the Carnegie Trust, *vide* p. i.

ORDER OF STUDY WHICH IS RECOMMENDED.

First Summer— Physics and Elementary Biology.

First Winter— Five months' course in Chemistry and Anatomy; three months' course in Practical Chemistry; Practical Anatomy.

Second Summer— Practical Anatomy and Lectures; Practical Physiology.

Second Winter— Practical Anatomy; Physiology—Five months' course.

Third Summer— Three months' course in Practical Pathology, Materia Medica, and Practical Materia Medica; Surgical Hospital Practice.

Third Winter— Six months' course in Surgery and Clinical Surgery; Attendance at Surgical Wards; Anæsthetics; Pathology.

Qualifications Given by the Scottish Colleges xxv

Fourth Summer—Three months' course in Midwifery, in Gynaecology, in Medical Jurisprudence and Public Health, and in Clinical Surgery; Hospital Practice.

Fourth Winter—Six months' course in Medicine and Clinical Medicine; Hospital Practice.

Fifth Summer—Three months at Clinical Medicine; Hospital; Insanity; Diseases of Children; Diseases of Eye.

Practical Midwifery—Personal attendance on twelve cases under the supervision of a medical practitioner, or three months' attendance at a Lying-in Hospital and personal attendance on six cases.

Fifth Winter—Hospital Practice; Fevers; Dispensary; Vaccination; Skin Diseases; Ear and Throat Diseases; Eye Diseases; Venereal Diseases; Operative Surgery.

PROFESSIONAL EXAMINATIONS.—Four of these are held during the curriculum. Each is held quarterly in Edinburgh and twice a year in Glasgow. Candidates may enter for all or any of the subjects at the First, Second, and Third Examinations. In the Final Examination the subjects of Medicine, Surgery and Midwifery shall be taken together at the conclusion of five Winters and five Summers of Medical Study, provided that a period of twenty-four months has elapsed since passing the Second Professional Examination; and the subject of Medical Jurisprudence and Public Health may be taken at any time after passing the Third Examination. Candidates are advised to enter for the entire examinations.

First Examination—Physics, Chemistry and Elementary Biology. This should be passed before the beginning of the second winter session.

Second Examination—Anatomy, Physiology, including Histology. This should be passed at the end of the second year of study.

Third Examination—Pathology, Materia Medica and Pharmacy. This should be taken at the end of the third year.

Final Examination—Can only be taken at the end of the fifth year. The candidate must have attained the age of twenty-one.

It includes—

1. Medicine, Therapeutics, Medical Anatomy, Clinical Medicine.
2. Surgery, Surgical Anatomy, Clinical Surgery, Diseases and Injuries of the Eye.
3. Midwifery and Diseases of Women.
4. Medical Jurisprudence and Public Health. This can be taken any time after the Third Examination.

FEES FOR PROFESSIONAL EXAMINATIONS.

For each of the first three, £5; for the final, £15. The minimum total expense, inclusive of fees for classes and examinations, amounts to £115.

Fees for examinations in *Edinburgh* should be lodged with Mr. D. L. Eadie, 50 George Square, and in *Glasgow* with Mr. Walter Hurst, 242 St. Vincent Street.

DIPLOMA IN PUBLIC HEALTH OF THE ROYAL COLLEGES.

The Diploma is granted by the Triple Qualification Board.

1. Every candidate for examination must hold a registrable medical qualification, which has been registered under the Medical Acts.

2. After obtaining such qualification he must have attended a recognised Laboratory in which Chemistry, Bacteriology, and the Pathology of the Diseases of Animals Transmissible to Man are taught; and the certificate must show that the candidate has conducted Chemical and Bacteriological analyses of air, water, sewage and foods, and certify that the candidate has attended not less than four calendar months, and that he has worked in the Laboratory for at least 240 hours, of which not more than one-half shall be devoted to Practical Chemistry.

3. After obtaining a registrable qualification he must during six months (of which at least three months shall be distinct and separate from period of Laboratory instruction required) have been engaged in acquiring a practical knowledge of the duties of Public Health Administration for not less than sixty working days under the personal supervision of—

- (a) In England or Wales, the Medical Officer of Health of a County or single sanitary District having a population of not less than 50,000, or a Medical Officer of Health devoting his whole time to Public Health work; or
- (b) In Scotland or Ireland, the Medical Officer of Health of a County or District or Districts with a population of not less than 30,000; or
- (c) In Ireland, a Medical Superintendent Officer of Health of a District or Districts having a population of not less than 30,000; or
- (d) In the British Dominions outside the United Kingdom, a Medical Officer of Health of a Sanitary District having a population of not less than 30,000, who himself holds a Registrable Diploma in Public Health; or
- (e) A Medical Officer of Health who is also a Teacher in the Department of Public Health in a recognised Medical School.
- (f) A Sanitary Staff Officer of the Royal Army Medical Corps having charge of an Army Corps, District, Command, or Division recognised for the purpose by the General Medical Council.

4. After obtaining a medical qualification he must have attended for three months at least twice weekly the practice of a Hospital for Infectious Diseases, at which he has received instruction in the methods of administration.

The examination consists of two parts. The first part includes—(a) Laboratory work, with Chemistry and Bacteriology; (b) Physics and Meteorology.

The Second Examination embraces—(a) Report on premises visited; (b) Examination at Fever Hospital; (c) Examination at Public Abattoir; (d) Epidemiology and Endemiology; (e) Vital Statistics and Sanitary Law; (f) Practical Sanitation.

Each examination is held bi-annually, in October and May. The fee for each is £6, 6s.; for re-examination, £3, 3s. Fees and applications to be lodged with Mr. D. L. Eadie, 50 George Square, Edinburgh; or with Mr. Walter Hurst, 242 St. Vincent Street, Glasgow.

MEMBERSHIP AND FELLOWSHIP OF THE ROYAL COLLEGE OF PHYSICIANS, EDINBURGH.

Every applicant for the *Membership* must possess a recognised qualification, and be not less than twenty-four years of age. He must pass an examination on Medicine and Therapeutics, on Clinical Medicine, and on some Special Department of Medicine, such as Psychological Medicine, General Pathology and Morbid Anatomy, Medical Jurisprudence, Public Health, Midwifery, Diseases of Women, Diseases of Children, Tropical Medicine, etc. The *Membership* is conferred by election.

The fee for the *Membership* is thirty-five guineas, except the applicant be a Licentiate of the College, when it is twenty guineas.

Members of not less than three years' standing may be raised by election to the *Fellowship*, the fee being thirty-eight guineas, exclusive of Stamp Duty of £25.

FELLOWSHIP OF THE ROYAL COLLEGE OF SURGEONS, EDINBURGH.

Every candidate must be twenty-five years of age, and must have been engaged for two years in the practice of his profession, after having obtained a recognised qualification in Surgery. The petition for examination must be signed by two Fellows—a proposer and seconder.

The candidate must pass an examination on Principles and Practice of Surgery, including Surgical Anatomy, Clinical Surgery, and any one of the optional subjects; Ophthalmic Surgery, Aural, Nasal and Laryngeal Surgery, Dental Surgery, Surgical Pathology and Operative Surgery, Gynaecology, Advanced Midwifery with Obstetric Surgery, Advanced Anatomy.

The fee is £45, except the candidate be a Licentiate of the College, when the fee is £35. Further particulars may be obtained from the Clerk to the College, 50 George Square, Edinburgh.

FELLOWSHIP OF THE ROYAL FACULTY OF PHYSICIANS AND SURGEONS
OF GLASGOW.

Every candidate must have been qualified for two years, and be aged twenty-four. Admission to the Fellowship is by examination and subsequent election. The candidate is examined on either (a) Medicine (including Clinical Medicine, Medical Pathology, and Therapeutics), or (b) Surgery (including Clinical Surgery, Operative Surgery, Surgical Anatomy, and Surgical Pathology); and on one optional subject—Anatomy, Physiology, Pathology, Midwifery, Diseases of Women, Medical Jurisprudence, Ophthalmic Surgery, Aural, Laryngeal and Nasal Surgery, Dental Surgery, State Medicine, Psychological Medicine or Dermatology.

The fee is £30, except the candidate be a Licentiate of the Faculty, when it is £15.

The Fellowship Diploma is now open to Women.

POST-GRADUATION STUDY.

The different University Laboratories provide facilities for research work. In most cases no fees are charged, but those engaged in research work are expected to defray the expense of materials. The Laboratory of the Royal College of Physicians of Edinburgh is splendidly equipped for the carrying out of all branches of medical research. It is available for research work to Members and Fellows of the Royal Colleges of Edinburgh and to other applicants approved by the Council of the Royal College of Physicians. No fees are charged, and the ordinary reagents, etc., are provided. By arrangement with the Superintendent, workers may have the assistance of members of the Laboratory Staff. Special post-graduate courses may be arranged.

EDINBURGH POST-GRADUATE COURSES IN MEDICINE.

These courses, which are held during the Summer Vacation, are arranged by a Committee appointed by the University and School of the Royal Colleges. The programme for 1916 has not yet been drawn up, but will no doubt be somewhat similar to that for 1914, which was as follows:—

JULY:—A series of classes dealing with *Obstetrics and Gynaecology* (fee, Seven Guineas), and another series on *Diseases of Children* (fee, Five Guineas), were arranged for during the last fortnight of the month.

AUGUST:—A Four Weeks' Course on *Internal Medicine*. This included two clinics daily upon diseases of the various systems, in addition to classes upon Applied Anatomy, Haematology, Bacteriology and the Examination of the Heart, Urine, Digestive Products and Nervous System, X-Ray Diagnosis, and the Medical Aspects of Morbid Pregnancy. Between six and seven hours instruction daily. Attendance limited to twenty-five. *Fee*, Ten Guineas.

SEPTEMBER :—A Four Weeks' *General Course*. Each fortnight was quite independent and might be taken separately. This included Medical and Surgical Clinics, Clinical Neurology, Dermatology, Fevers, Ophthalmology, Pediatrics, Infant Feeding, Applied Anatomy, Morbid Anatomy, Pathological Histology, etc. *Fee*, Five Guineas for the month or Three Guineas for either fortnight. A series of lectures upon subjects of general interest was given in connection with the course. These lectures were open to all practitioners.

A Four Weeks' *Surgical Course* included Surgical Clinics, Applied Anatomy, Surgical Pathology, Operative Surgery, etc. Attendance limited to thirty. *Fee*, Ten Guineas.

A Special Surgical Course during the second fortnight of September on the *Genito-Urinary Tract*. *Fee*, Six Guineas.

A Course on the *Ear, Nose, and Throat* (limited to ten) included classes on the pathology of this subject and operative work in addition to demonstrations on the methods of examination, clinics, etc. *Fee*, Ten Guineas.

A *Series of Classes*, the entries for which were limited, upon Hæmatology, Bacteriology, X-Rays, Gynecology, Gynecological Pathology, Ophthalmoscopy, Errors of Refraction, Ear, Nose and Throat, Histological Methods, etc. These classes were open only to those who had entered for the General, Surgical, or Ear, Nose and Throat courses, on payment of an Additional Guinea in each instance.

The various courses are attended by numbers of men which every year for some summers past have shown a steady increase. To ensure places for the limited courses it is necessary in some cases to enter at least three months before the beginning of the course desired.

In addition to these courses the classes throughout the year on Bacteriology, Diseases of the Blood, Diseases of the Tropics, Neurology, etc., are attended by a number of graduates.

Particulars of these classes are to be had from the Secretary, The New University.

EDINBURGH MEDICAL JOURNAL.

EDITORIAL NOTES.

HONOURS.

AMONG those on whom His Majesty has been pleased to confer the honour of Knighthood on the occasion of his birthday, we note with pleasure the name of one of Edinburgh's most distinguished *alumni*, JAMES MACKENZIE, Esq., M.D.(Edin.), M.R.C.P.(Lond.).

The same honour was conferred on FREDERICK NEEDHAM, Esq., M.D.(St. And.), M.R.C.P.(Edin.), one of the Commissioners of the Board of Control.

The list of those whom His Majesty has been graciously pleased to reward with the DISTINGUISHED SERVICE ORDER "for gallantry and devotion to duty," in connection with the operations at the Dardanelles, includes the names of

Major E. I. O'Neill, F.R.C.S.(Edin.), M.B.(New Zealand), New Zealand Medical Corps; Captain A. G. Butler, Australian Army Medical Corps.

In the list of the rank and file to whom the DISTINGUISHED CONDUCT MEDAL has been awarded "for acts of gallantry and devotion to duty," it is pleasant to find a goodly proportion of members of the medical services—

Staff-Sergeant H. Jackson, Australian Army Medical Corps; Sergeant I. Cook, R.A.M.C.; Corporal J. Hart, R.A.M.C.; Corporal I. W. Jones, R.A.M.C.(T.); Lance-Corporal W. Singleton, New Zealand Field Ambulance; Lance-Corporal G. Stedman, New Zealand Medical Corps; Private Stockdill, Stretcher Bearer; Private A. Cook, R.A.M.C.(T.); Private T. Bennet, R.A.M.C.; Private J. Hughes, R.A.M.C.; Private C. F. Keen, R.A.M.C.; Private A. Whitear, No. 8 British Field Ambulance.

CASUALTIES.

KILLED in action in Flanders on 20th May, Major JAMES WOODS, I.M.S.

Major Woods graduated M.B., Ch.B., in the University of Edinburgh in 1901, and entered the Indian Medical Service the following year. He served in various operations in India, was mentioned in dispatches in 1908, and received the medal and clasp. He was serving with the 39th Garhwal Rifles at the time of his death.

DIED of wounds on 14th June, Surgeon THOMAS LOUIS GRENET STEWART, R.N., M.B.

Surgeon Stewart graduated M.B., Ch.B., in the University of Glasgow in 1911. He held a temporary commission as Surgeon in the Navy.

DIED of wounds received on the 17th May, Lieutenant DAVID GALLOWAY WATSON, R.A.M.C.

Lieutenant Watson graduated M.B., Ch.B., in the University of Edinburgh in 1913. He was one of the best known students of his time, and took a leading part in the undergraduate life of the University, particularly in connection with the work of the Students' Representative Council, and in the management of the *Student*. He was sent to France early in August, and when he was wounded was attached to the 2nd Battalion Bedfordshire Regiment. His commanding officer writes—"I have already forwarded his name for particularly good and gallant conduct performed at Neuve Chapelle, and am again sending a report to the same effect for his work at the time he received his wounds." He was a son of Mr. John Watson, B.A., Headmaster of Broughton Higher-Grade School, Edinburgh.

DIED of wounds on 17th June, Major JAMES CRAIK TAYLOR, R.A.M.C.

Major Taylor graduated M.B., C.M., in the University of Glasgow in 1896. He served in the South African War, and before being called up on the outbreak of war was in practice at Newlands, Glasgow.

EVEN war has laughter mingled with its tragedy. "La bromidrose fétide des Allemands." The report by M. Berillon* of a new minor horror—that the German smells nastily—has about it a Rabelaisian humour which it is pardonable to enjoy. Whatever the scientific basis of M. Berillon's discovery, there rises the suspicion that it has a subjective as well as an objective reality: to cry that an enemy stinks is the last and bitterest of all gibes, for the animal which depends for its safety on being malodorous awakens disgust as well as fury. That the alien smells badly is a widely held sentiment. The Yankee in the last resort clinches his argument for disliking negroes by saying that they "stink like polecats"—a reason as conclusive as it is unanswerable; the schoolboy knows no more deadly insult than that which Stalky—hero of "an unsavoury interlude"—hurled against Mr. King's house; and two or three centuries ago (it seems now) M. Maupassant delighted Paris with a *conte* whereof the plot explained "*pourquoi les dames anglaises se sentent toujours de caoutchouc*."

Now for M. Berillon and the great German stench.

It seems, then, that the French doctors attending prisoners and wounded have learned to recognise an odour *spécifique, fétide, nauséabonde, et persistante*. The unwounded smell as strongly as the wounded, and the personal effects of the prisoners are so unsavoury as to require disinfection. Bromidrosis is common in Germany; it was a favourite study of Hebra and Lassar; and there is a great traffic in remedies for it in the pharmacies of the Empire. In Alsace it is a common place that a German battalion on the march leaves behind it an aroma which hangs about the route for half an hour, and (it is said) a sensitive French aviator can savour an enemy army corps from the heights of the empyrean. On the authority of Bazy, the surgeon, we have it that

* *Bullet. et mém. de la société de méd. de Paris*, No. 768, 9th and 23rd April 1915.

barracks occupied by the German troops in 1870 were redolent for two years, despite energetic fumigation.

This peculiar virtue of the skin is widely distributed in Germany: is endemic in Pomerania and Brandenburg; and its origin is Prussian. Thence it has spread to the other tribes of Central Europe. The Hohenzollerns, of course, are victims of the scourge; it is an ancestral trait, like the Hapsburg chin and the Bourbon nose. The All-Highest, however, suppresses rather than cherishes his heritage (which for the rest gives rise among his entourage to "*allusions du goût le plus douteux*"), for whenever he visits a town where there is no Royal palace, his hosts must perforce erect for him a most luxurious toilet chamber at great cost. In Cologne 20,000 marks were spent in this way, but the Socialist municipality of Nuremberg got off cheaper, fabricating one of cardboard and stucco for a matter of ten pounds!

The evils of bromidrosis are known to the great general staff, and wholesale fumigation precedes manœuvres, lest the noses of the generals may be too rudely tested: Alsatian recruits, however, are less considered, and in the barracks *leur odorat est continuellement soumis au plus douloureux des supplices*.

M. Berillon argues that bromidrosis arises from the action of the nervous system on the secretory functions; that the mentality of the German, with his overgrown pride, impulsiveness, and morbid irritability, has a bearing on its production. The German has neither developed the control of his instincts nor acquired mastery of his vasomotor reactions; under the influence of rage or fear his secretory glands are unduly active. The analogy is obvious.

It is not necessary to follow our author through his speculations as to the cause of this physical peculiarity of the Germanic peoples, or to inquire how far the facts as to their metabolism, as measured by the quantity and composition of their excrement, are relevant. Still less dare we quote from his penetrating analysis of the components of this odour, not of Araby, and the orifices of the body whence these components derive. Dean Swift's pen alone could have done justice to such a topic. Nietzsche, the Slav and candid friend of Germans, ends his well-known invective on their food and drink with the epigram, "The German spirit is an indigestion; it can never complete anything." From much the same data M. Berillon sums up their metabolism in the phrase, "*L'allemand urine par ses pieds*."

Since it is only a question of one bad smell more or less in the world, and a German one at that, detached impartiality is unnecessary, wherefore the discussion at the Paris Society of Medicine need not be scrutinised too closely. As literature, M. Berillon's paper does not compete with the "Hymn of Hate"; but as an essay in contempt it far excels the poem. If it should by chance be read by our friend the enemy it may blister and rankle a little; conceivably it might also help to cure the bad smell, an attribute of which even a Prussian could scarcely boast; but perhaps he would—who knows!

CLINICAL STUDIES. V.—BILATERAL LESION IN THE OCCIPITAL LOBES CORRECTLY DIAGNOSED TWENTY-FOUR YEARS BEFORE DEATH, WITH HISTO-PATHOLOGICAL REPORT BY DR. J. SHAW BOLTON, SHOWING THE POSITION OF THE CORTICAL AREA FOR MACULAR AS DISTINCT FROM NON-MACULAR OR PANORAMIC VISION.

By BYROM BRAMWELL, M.D., F.R.C.P.E., LL.D., F.R.S.E., Consulting Physician, Royal Infirmary, Edinburgh; Physician, Chalmers Hospital, Edinburgh.

IN the last number of this *Journal* I referred to some of the difficulties with which the clinician is handicapped in making original observations as compared with the physiologist, and stated that "the cases with which he has to deal are, in many instances, few and far between; the diseased conditions are often of long duration, and have to be watched for many years; post-mortem examinations in cases which have been carefully studied and watched for many years are often not obtained, and, even when obtained, the terminal conditions are often so complicated that it is difficult to draw satisfactory and definite conclusions." These statements are based on a long and large experience. The following case is a striking illustration of some of these difficulties, though fortunately in it they were overcome:—

The patient, a man of 45, was sent to me by Dr. George A. Berry in February 1886, complaining of loss of sight. Dr. Berry reported that there was nothing wrong with his fundus. The loss of sight, which consisted of complete loss of peripheral vision with very marked reduction of macular vision, had come on suddenly, with an attack of what appeared to be uramic convulsions, in June 1884.

I diagnosed the condition as probably due to a bilateral lesion of the occipital lobes in the region of the half-vision centre. The case did not appear to be one of the rare cases of double homonymous hemianopsia, in which a lesion of one occipital lobe (say the right) produces a homonymous hemianopsia on the opposite (say the left) side, and a second and subsequent lesion in the other (say the left) occipital lobe produces a homonymous hemianopsia on the opposite (say the right) side, but a *simultaneous* bilateral lesion in the right and left occipital lobes—an infinitely rare, if not a unique, condition.

I recorded the case in my *Atlas of Clinical Medicine* (vol. ii.

p. 49), published in the year 1893 (seventeen years before the patient's death), and there stated:

"This is a most interesting case. In the absence of a post-mortem examination it is, of course, difficult to say with any degree of certainty what is the position and pathological character of the lesion. But the condition of the visual defect—complete abolition of peripheral vision, with, comparatively speaking, good central vision both for white and for colours—and the absence of any changes in the fundus oculi are, I think, strongly suggestive of a bilateral lesion of the half-vision centre in the back part of each occipital lobe."

I watched the case carefully until the patient's death on 21st October 1910, a period of twenty-four and a half years, making it worth his while to see me every six months, in order that I might keep in touch with his condition. I recognised that the case was one, not only of very great rarity, but of the highest scientific interest, which might lead to very important results in determining the position of the centre for macular vision as distinct from peripheral vision if it were possible to examine the brain post-mortem.

During the whole period ($24\frac{1}{2}$ years) that the patient was under my observation the condition remained, practically speaking, unchanged, and there were no further cerebral developments—central (macular) vision improved slightly, peripheral vision remained completely obliterated. Throughout the whole course of the case there was no motor paralysis, no loss of sensation, and no aphasia, either sensory or motor.

In April 1905 (twenty-one years after the onset of the lesion, and five years before the patient's death) Dr. A. H. H. Sinclair kindly examined the patient and gave me an exhaustive report on the condition of vision and of the fundi, and accurate charts of the fields of vision (see Figs. 3 and 4).

The patient died of acute croupous pneumonia on 21st October 1910, aged 71. Through the kindness of Drs. George Donald and George M. Johnston of Leith I was able to make a post-mortem examination.

A large lesion was found in each occipital lobe.

The case seemed to me to be of so much scientific interest that I asked Dr. J. Shaw Bolton, the leading authority on the occipital cortex and the visual area, to undertake the microscopical examination. This he very kindly consented to do.

On 27th May 1915 Dr. Shaw Bolton sent me an exhaustive

report on the case, with many photographs and drawings; these will be published in a future number of *Brain*. In sending me his report he wrote: "Not only, in fact, is the case a unique one, but the histological results which have been obtained have more than justified the elaborate method of investigation employed and the lengthy period during which it has been in progress. A case of this kind, however, should be examined properly or left alone, and I have chosen the former." In summing up the results of his investigation he states: "The histological investigation of this case may thus claim not only to have explained the clinical features present during life, but to have added to our knowledge of the part played by the visuo-sensory area in macular and in non-macular or panoramic vision. It may, in fact, be stated that the anatomical basis of the former is the cortex of the calcarine core of the pear-shaped visuo-sensory area, and that the anatomical basis of the latter lies in the surrounding and remaining visuo-sensory cortex."

A further conclusion, based upon the condition of macular vision for white and for colours as observed during life, to which Dr. Shaw Bolton does not refer, may also, I think, be added, namely, that if there is a cortical centre for colour vision, the cortical macular centre for white and for colour vision is the same; in other words, that there is no separate cortical centre for colour vision, as was at one time supposed. (On this point Dr. Shaw Bolton writes me as follows:—"It is impossible to form any opinion, histologically, on the subject of colour vision, and it is as certain as it can be from recent researches that colour vision is the result of purely chemical processes which take place in the *retina*.")

It is worthy of note, considering the great extent of the lesion in both occipital lobes and the extensive severing of the connections between the visuo-sensory centre and the other parts of the brain, that there was no mind-blindness.

The case is, as Dr. Shaw Bolton states, unique and of the highest scientific value. It was carefully studied during life and watched for a period of twenty-four and a half years by myself; the ocular and visual condition was carefully noted by two leading authorities on ophthalmic medicine—at the commencement of the case by Dr. George A. Berry, and at the end of the case by Dr. A. H. H. Sinclair; and the histological investigation, involving as it has done an enormous amount of time and labour, was carried through by the leading authority on the

histology of the visual area and occipital lobe, Dr. J. Shaw Bolton, assisted by Dr. William Robinson.

It should be noted that the very important physiological question—the cortical localisation of macular and non-macular vision—is a question which can only be determined by the combined observations of the clinician and the pathologist *in vivo*. This question and many others, such as all the intricate and difficult questions connected with the nature and localisation of the speech functions, cannot be determined by the observations, however minute and accurate, of the physiologists on the lower animals.

The details of the case are as follows:—

Acute general dropsy (probably due to acute nephritis); epileptiform convulsions; permanent loss of peripheral vision, the fields being enormously contracted; central vision both for white and for colours fairly good; fundi oculi normal; no mind-blindness and no word-blindness. The diagnosis, made twenty-four years before death, was “probably a bilateral lesion in the occipital lobes”; death at the age of 71, twenty-six and a half years after the onset, from acute croupous pneumonia. During these twenty-six and a half years there were no fresh head symptoms, and practically no change in vision, no motor paralysis, no loss of sensation, no aphasia, sensory or motor. On post-mortem examination a large lesion was found in each occipital lobe. Exhaustive microscopic examination of the visuo-sensory area by Dr. J. Shaw Bolton.

M. M'G., a labourer, aged 45, was sent to me by Dr. Berry on 24th February 1886, complaining of loss of sight.

Previous History.—The patient stated that he had enjoyed good health until June 1884, when he had a severe illness, which seemed to have been acute nephritis with uræmia. The attack commenced with bronchitis and “stoppage of the water” (he does not know if the water was red or bloody); his face, body, and limbs swelled, and he lost his appetite. During the course of the attack he suddenly lost his eyesight, and almost immediately afterwards had a series of epileptic fits. He was unconscious for fourteen days; it was three weeks before he could recognise voices. When he regained consciousness he was quite blind; since then his eyesight (central vision) has been gradually restored in some degree.

Since he recovered from the acute stage of the attack his general health has been good; he now feels well, if it were not for the loss of sight; he is, however, “at times heavy and inclined to sleep.” For some time after he recovered from the acute attack he occasionally suffered from headache, but the pain was not frequent and not severe:

for the past year there have been no headaches. He has not suffered from giddiness or vomiting. His face has never swelled since he recovered from the acute attack. He has not had syphilis.

Condition on 24th February 1886.—The urine was absolutely normal, and the heart and other organs quite healthy; the patient was muscular and well nourished. There was no motor paralysis, no loss of sensation, and no aphasia, either sensory or motor.

The knee-jerks were normal; there had been no lightning pain; the pupils were of medium size, they contracted actively both to light and accommodation—in short, there was no suspicion of tabes.

Central vision for white was very defective ($V = \frac{3}{18}$). The peripheral portions of the field were so greatly constricted that peripheral vision was nil.

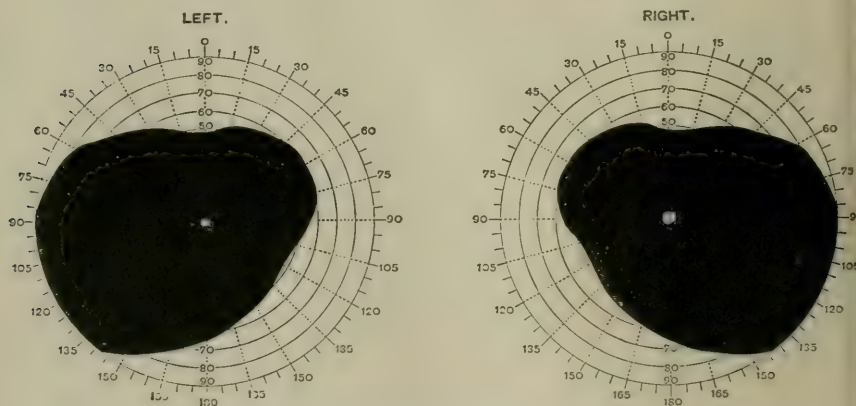


FIG. 1.—Perimeter Chart of the Fields of Vision in the Case of M. M'G., described in the Text, taken on 12th January 1887. (Reduced from $9\frac{1}{2}$ ins. to $4\frac{1}{2}$ ins.)

There were no ophthalmic changes—a fact confirmed by Dr. Berry.

Subsequent Progress of the Case (12th January 1887).—The patient's general health is good. His sight is better; he says that he can see little objects, such as a pin on the floor, but that he fails to see larger objects, and often runs up against things, tumbles over his children, etc. Central vision has improved—right eye = $\frac{5}{18}$ imperfectly; left eye = $\frac{3}{18}$ imperfectly; central colour vision good. The condition of the fields at this date (12th January 1887) is shown in Fig. 1.

9th March 1891.—His general health is good. The urine continues quite normal; there have been no head symptoms—in fact no nervous symptoms at all, except the affection of sight. He stated that he sees objects distinctly when they are placed directly in front of him; and that he can see small objects, such as a pin or a small piece of white paper the size of a pea on the floor. I satisfied myself that this statement was correct. In order to see a small object on the floor in front

of him he moves his head and eyes about (ranges over the area where he knows the object is) until he gets it in the line of central vision.

Central vision is fairly good—much better than it was four years ago: at 18 feet he correctly named with the right eye one of the test letters which ought to be read at 18 feet; and three out of five of the letters which ought to be read at 24 feet. (Right eye, $V = \frac{1}{2}$ imperfectly.)

With the left eye he could not recognise any of the letters which ought to be read at 18 feet, but at this distance he correctly named three of the five letters which ought to be read at 24 feet. (Left eye, $V = \frac{1}{4}$ imperfectly.)

Vision was not improved by glasses.

Central vision for colours was perfect in each eye.

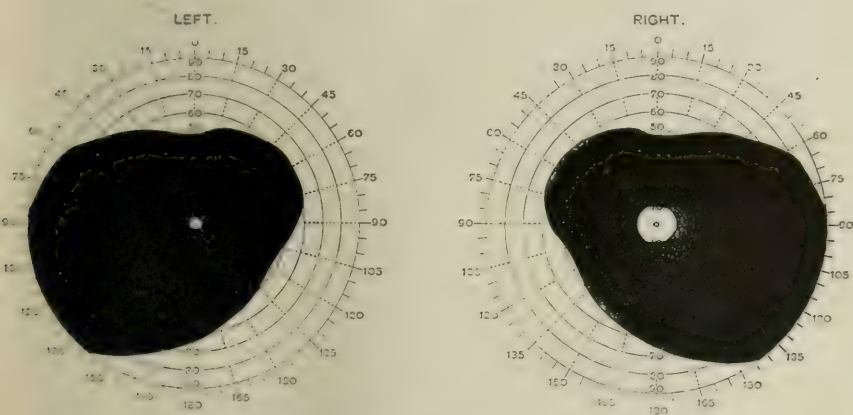


FIG. 2.—Perimeter Chart of the Fields of Vision in the Case of M. M'G., described in the Text, taken on 19th March 1891. (Reduced from $9\frac{1}{2}$ ins. to $4\frac{1}{2}$ ins.)

He says he cannot see anything at the sides, above or below. The fields of vision were again mapped out with the greatest care; the area of central vision was a little, but only very little, larger than on 12th January 1887; the improvement was most marked in the right eye (see Fig. 2).

The pupils contracted actively both to light and on convergence.

There were no abnormal ophthalmoscopic appearances.

The day on which these observations were made was particularly clear and bright.

His mental condition is not very bright, and he says his memory is not good, but there is no mind-blindness and no word-blindness. He walks about the streets without assistance, coming up every six months by himself to the Royal Infirmary to see me. He can read large type, such as the prices of objects in shop windows.

On 19th May 1891 the patient was admitted to the Edinburgh

Royal Infirmary suffering from scurvy, under Professor Wyllie, who has kindly allowed me to see his notes. The attack had commenced twelve days previously, and had evidently produced marked (temporary) deterioration of vision and of the mental condition. The patient was stupid, his memory was poor, the vision very defective. He was discharged cured of the scorbutus on 18th June 1891.

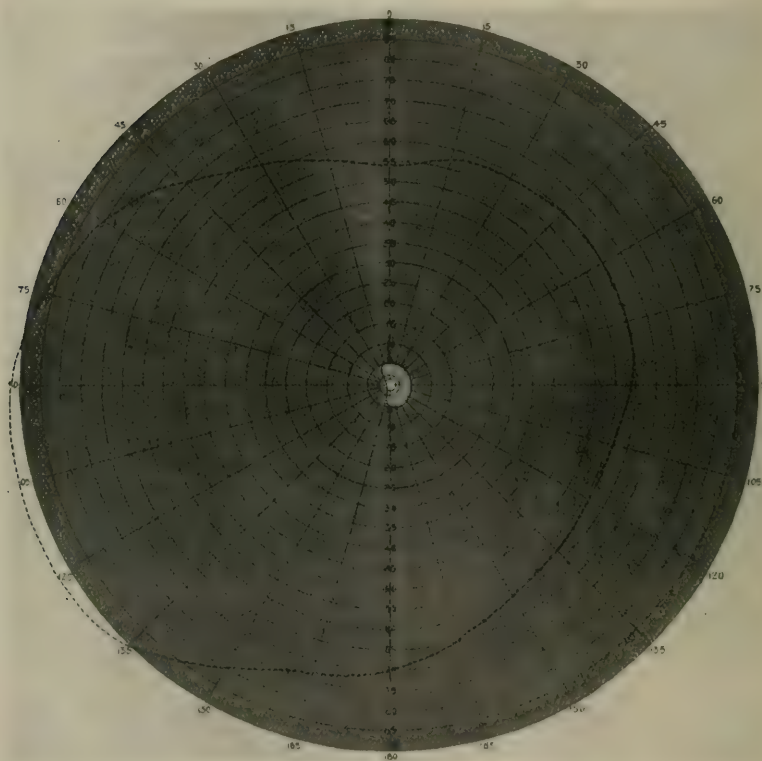


FIG. 3.—Perimeter Chart of the *Left* Field of Vision in the Case of M. M'G., taken by Dr. Sinclair on 10th April 1905. (Reduced from 7½ ins. to 4 ins.)

The dark interrupted line encloses the area over which the field of vision normally extends. The part of the dark shading within the dotted line shows the extent to which blindness had encroached on the field, and the area at the centre, which is very lightly shaded, indicates the remaining field.

The remaining field responded to a white test object 10 mm. in diameter and seen at 250 mm. distance (as taken with the perimeter).

The small white areas within the remaining field on the right side of the fixation point responded to a smaller stimulus, *i.e.* a white test object 10 mm. in diameter and seen at 2000 mm. distance on Bjerrum's screen.

8th January 1893.—There is no change in the general condition; vision is not so good as it was on 9th March 1891.

26th April 1894.—Does not feel so well; thinks his sight is not so good; is occasionally giddy: a strange feeling—"sort of weakness"—comes over him at times. His memory, he says, is impaired, but his

visual memory (for places, objects, etc.) is not specially interfered with. He walked up alone from Leith to the Edinburgh Royal Infirmary to-day.

8th April 1905.—*In statu quo.* The patient continues to come up to the Infirmary to see me every six months, as he has done regularly during the past twenty years. General health good.

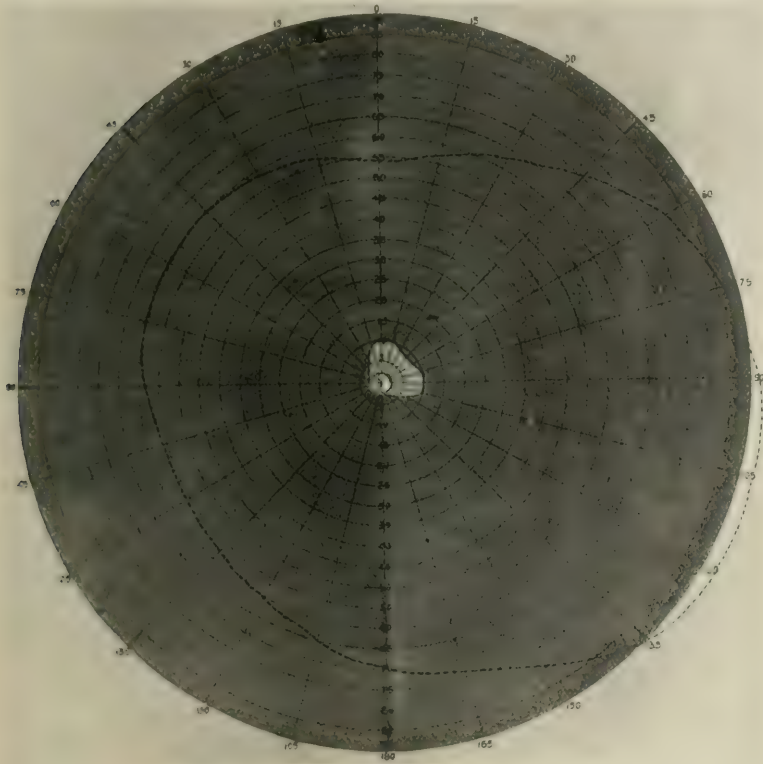


FIG. 1.—Perimeter Chart of the Right Field of Vision in the Case of M. MCG., taken by Dr. Sinclair on 10th April 1905. (Reduced from 7½ ins. to 4 ins.)

The dark interrupted line encloses the area over which the field of vision normally extends. The part of the dark shading within the dotted line shows the extent to which blindness had encroached on the field, and the area at the centre, which is very lightly shaded, indicates the remaining field.

The remaining field responded to a white test object 10 mm. in diameter and seen at 270 mm. distance (as taken with the perimeter).

The small white areas within the remaining field on the right side of the fixation point responded to a smaller stimulus, i.e. a white test object 10 mm. in diameter and seen at 2000 mm. distance on Bjerrum's screen.

Dr. Sinclair kindly made an exhaustive examination, and sent me the following report on the ocular condition and vision:—

DR. A. H. H. SINCLAIR'S REPORT (10TH APRIL 1905).

There is some slight chronic conjunctivitis present in both eyes—

right eye, $V = \frac{6}{36}$ uncertainly ; left eye, $V = \frac{6}{36}$ and $\frac{6}{24}$ partly. Central fixation is present, but is not perfect.

The field of vision is very greatly contracted, and more so on the left side in both eyes (see Figs. 3 and 4). The fixation point is probably encroached upon on the left side in both eyes. The slightly larger extent of the right field corresponds to the patient's statement that he can see "a little wider with the right."

The pupils are small—3 mm.—react to light, and are equal.

The eyes move normally. Convergence and other movements are uncertainly performed, because of the failure in indirect vision.

The *ophthalmoscopic examination* shows both discs to have a somewhat leaden-grey atrophic appearance, with extensive shallow cupping, probably more than the original physiological cupping.

There is a well-developed scleral ring round each disc—quite like the high-water-mark seen round the disc in glaucoma; though not in this case connected with glaucoma, it is an evidence of the atrophic process which apparently has been going on for a long time.

The general fundus shows in each case some tessellation of the choroid. In the left eye there are some slight changes in the choroid between the disc and the macula.

The retinal arteries have a hard "silver-wire" look, but otherwise the retinal vessels are normal.

On 15th June 1905 the patient was admitted to the Edinburgh Royal Infirmary, under my care, suffering from scurvy of a fortnight's duration. He was discharged cured of the scorbutus on 7th July 1905.

2nd June 1910.—No change since the last note; general health good; walked up from Leith alone as usual to see me to day; his memory, he says, is no worse; can read large type; can write, but does not write letters—his sight is so bad that the lines run into one another.

After the patient's death his daughter, with whom he lived, told me that she remembered his having one convulsion of recent years. He could, she said, read large type, and could tell the prices of objects in the shops. He only once, so far as she remembered, wrote a letter; it was very bad, for he wrote one line on the top of another. He never complained of his head; his memory was good, and his mind was all right. He was able to find his way about quite well.

The patient died, at the age of 71, from acute croupous pneumonia on 21st October 1910. Through the kindness of Drs. Donald and Johnston I was informed of the patient's death, and was able to get permission for a post-mortem examination.*

* One hit like this compensates for many misses. I have carefully studied and watched a number of cases for years with a negative result, either losing sight of the patients, failing to hear of their deaths until they were buried, or being refused permission to verify my observations by post-mortem examination.

POST-MORTEM EXAMINATION.—This was made on 22nd October 1910 (twenty-six years after the occurrence of the cerebral lesion) by Mr. W. Waldie in my presence.

Head.—The dura mater was somewhat thickened and adherent at the vertex.

The arteries at the base of the brain were somewhat atheromatous—a marked patch of atheroma was situated in the right posterior cerebral artery just beyond its junction with the circle of Willis, and



FIG. 5.—Brain in the Case of M. M'G., showing the Appearance of the Occipital Lobes as seen from behind.

The letter *a* points to the lesion in the right, and the letter *b* to the lesion in the left occipital lobe.

another on the left common carotid artery just at its junction with the circle of Willis.

The convolutions of the brain, more particularly of the frontal lobes, were somewhat atrophied and separated by deep sulci—apparently a senile change.

A large lesion was present in each occipital lobe and a small superficial lesion in the adjacent part of the right temporo-sphenoidal lobe (posterior end of the middle temporo-sphenoidal convolution).

In the right occipital lobe an extensive lesion was seen (see Figs. 5 and 6), a marked depression in the middle of the lobe, and shrinking in of the convolutions, with discoloration, involving more particularly

the upper and middle convolutions; the lower convolution at its tip and the visual area (cuneus and calcarine area) appeared to be normal.

In the left occipital lobe there was a marked depression on the upper surface, apparently leading into a cavity in the interior of the brain (see Figs. 5 and 7). The surrounding convolutions were plump and apparently normal.

Viewed from the side, there was marked depression at the junction of the right occipital lobe with the back part of the temporo-sphenoidal lobe (see Fig. 6). A small part of the posterior end of the right middle temporo-sphenoidal convolution was shrunken and atrophied (the result of an old softening).

There was also an area of superficial softening in the middle part of the middle and lower temporo-sphenoidal convolutions on the right

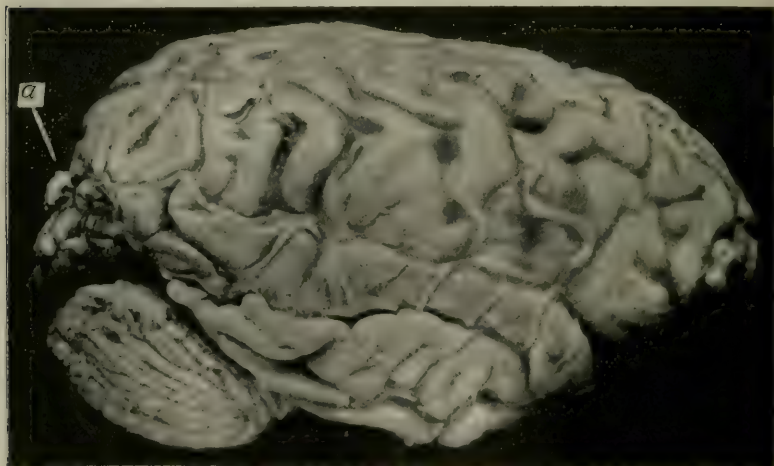


FIG. 6.—Lateral View of the Right Side of the Brain in the Case of M. M.G., showing the Appearance of the Occipital Lobe, to which the Letter *a* points.

side (see Fig. 7); it was separated from the occipital lobe by an area of normal brain tissue, measuring one inch from before backwards.

After separating the cerebellum and looking at the back part of the base of the brain from below, there was a marked depression on the right side at the junction of the occipital and temporo-sphenoidal lobes. The convolutions of the occipital lobes (both right and left) on their under surfaces were plump and normal.

The brain was injected with 10 per cent. formalin. On 12th November 1910 it was cut into three sections (see Fig. 8). The lateral ventricles were greatly dilated (see Fig. 9). The whole brain was sent to Dr. Shaw Bolton for further examination.

Nature of the Brain Lesion.—The brain lesion consisted in extensive destruction of the white matter and part of the cortex of the left occipital lobe and very extensive destruction of the white and grey

matter of the right occipital lobe. The lesions apparently were the result of old softenings, probably, from the very sudden onset, embolic in origin, with great secondary (compensatory) dilatation of the lateral ventricles.

Lungs.—*Right*—the upper lobe, which was adherent, was consolidated by acute croupous pneumonia. On section, the affected area was found to be in a state of grey hepatisation, almost gangrenous. *Left*—congested and oedematous, but otherwise normal.

Heart.—This showed senile changes but no valvular lesion.

Kidneys.—Both were rather pale and somewhat atrophied, but not markedly abnormal.

Bladder.—This was much thickened and encrusted with phosphates—acute and chronic cystitis.

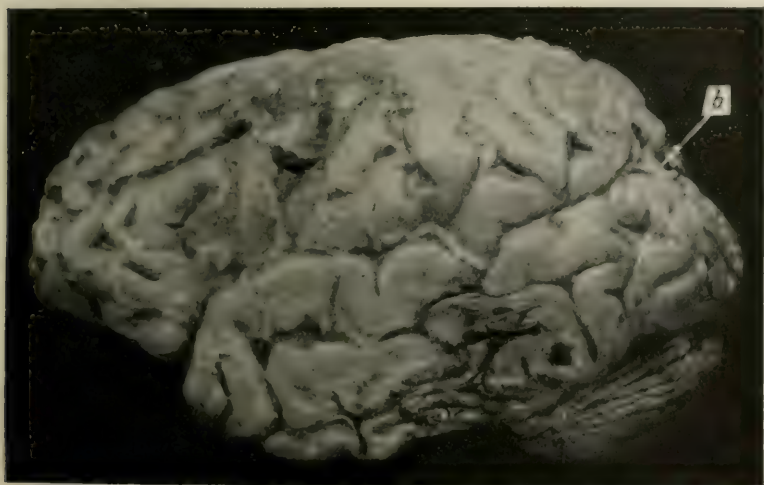


FIG. 7.—Lateral View of the Left Side of the Brain in the Case of M. M.G., showing the Appearance of the Occipital Lobe, to which the Letter *b* points.

DR. SHAW BOLTON'S REPORT ON THE CONDITION OF THE BRAIN.

On 27th May 1915 Dr. Shaw Bolton sent me a detailed account of the condition of the brain and of the histological appearances in the visuo-sensory areas. This report, with numerous illustrations, will be published in a future number of *Brain*. The conclusions which Dr. Shaw Bolton draws from his investigations are as follows:—

The fact that the visuo-sensory area generally is normal in distribution makes it certain that the gross contraction of the visual fields, which is found clinically, is due to an associative block, and that this block is not quite so complete on the left side

of the visual apparatus as on the right (and in the right fields of vision as in the left), in association with a smaller or less important lesion on the left side of the cortex. This is indicated histologically by the disuse atrophy of the visuo-sensory

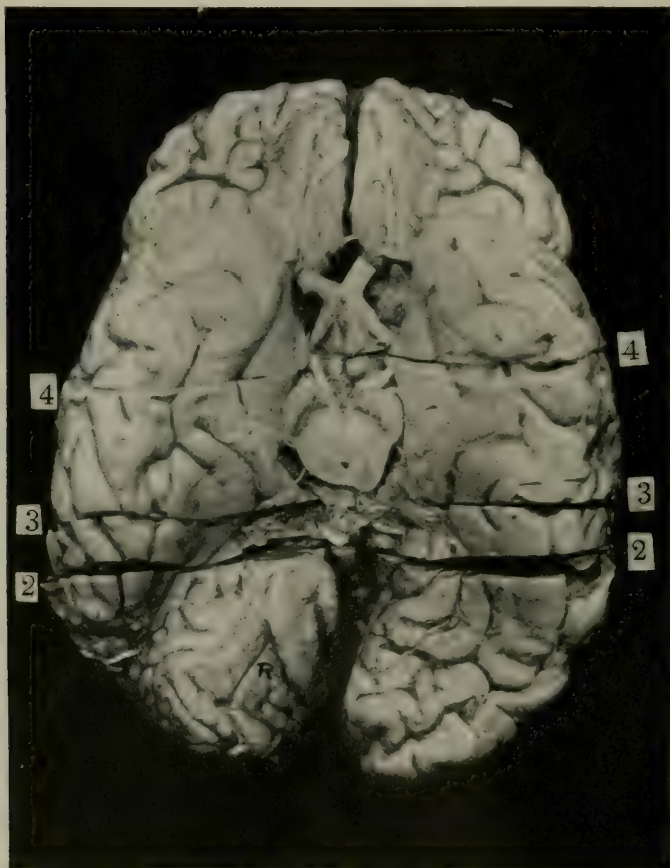


FIG. 8.—Base of the Brain in the Case of M. M'G., the Cerebellum detached, showing the Position of the Transverse Vertical Sections—2, 2; 3, 3; and 4, 4.

cortex, which is everywhere marked, with the exception of the more central (calcarine) portion.

It would therefore appear that the calcarine core of the visuo-sensory area serves in some degree as an anatomical basis for macular as distinct from non-macular or panoramic vision.

This conclusion is supported by the fact that the lesion in the right hemisphere reaches up to the posterior portion of this calcarine core. This fact at the same time incidentally explains

why in this case the right field of (central) vision was a little more extensive than the left.

It appears, therefore, to be probable that human macular vision is an evolution dependent on (1) the development of binocular vision, *i.e.* on the employment of corresponding parts of the retinae simultaneously, and on (2) the simultaneous development of the capability to pay prolonged and individual attention to particular points of the general visual panorama.

Macular vision is thus superposed on the neuronc apparatus for panoramic, and the two types shade into one another, the

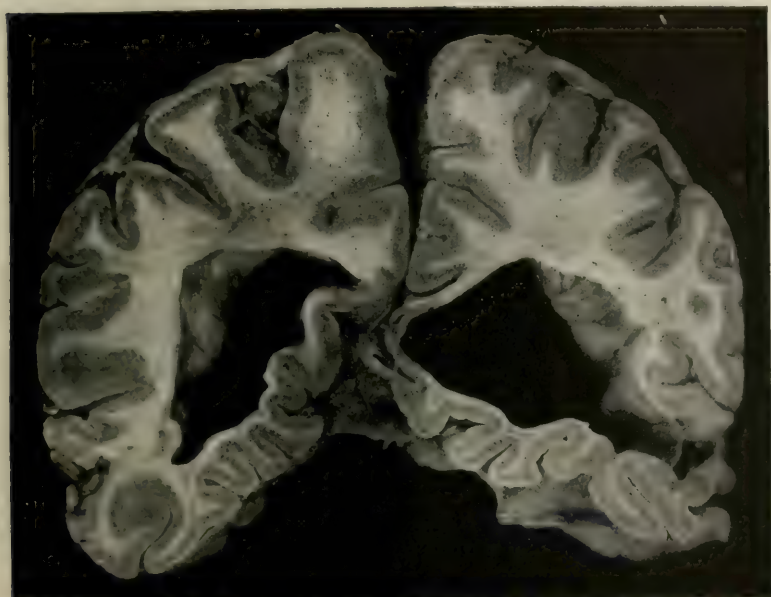


FIG. 9.—Transverse Vertical Section of the Brain in the Case of M. M'G., at the Level 3, 3, in Fig. 8, showing great Secondary (Compensatory) Dilatation of the Ventricles.

central parts of the retinae and the corresponding central (calcarine) cores of the pear-shaped visuo-sensory areas being the parts concurrently employed in macular vision.

The associative block caused by the lesions in this case, therefore, being greater on the right side than on the left, must thus be regarded as having been enough to stop the passage of the feebler panoramic stimuli without interfering seriously with the macular and stronger visual stimuli.

The continued passage of the latter has prevented the onset, in the calcarine core of the visuo-sensory area, of the disuse atrophy which elsewhere in these areas is general.

Lastly, the slight maiming of the right calcarine core posteriorly is responsible for the fact that the clinical visual field of the case was rather less extended on the left side.

The histological investigation of this case may thus claim not only to have explained the clinical features present during life, but to have added to our knowledge of the part played by the visuo-sensory area in macular and in non-macular or panoramic vision. It may, in fact, be stated that the anatomical basis of the former is the cortex of the calcarine core of the pear-shaped visuo-sensory area, and that the anatomical basis of the latter lies in the surrounding and remaining visuo-sensory cortex.

STUDIES FROM THE PATHOLOGICAL DEPARTMENT OF THE UNIVERSITY OF EDINBURGH.

CASE V.

CASE OF OSTEOMYELITIS WITH PYÆMIA.

Day Book, 629.

Museum Book, 553, 554, 555.

THE patient was a schoolgirl, aged 11. On 27th November she began to complain of pain in her left ankle, and next day of pain in her left forearm. At first the pains were rather indefinite, but later became boring and shooting in character. No history of any injury could be elicited. She was admitted to hospital on 30th November and was operated on at once.

The left forearm was swollen, red, and tender all over, the tenderness being more marked over the lower end of the radius. The swelling was brawny and œdematous, and was greatest about the middle of the ulna. No fluctuation could be made out, and there was no local increase of temperature.

The left ankle was swollen, reddened, and tender under both malleoli, but no fluctuation was obtainable here. The axillary and the inguinal glands were not palpable.

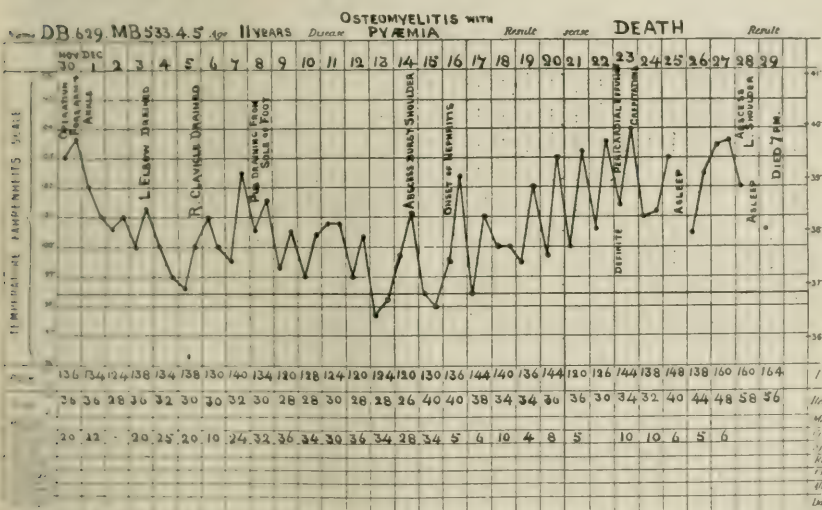
The temperature on admission was 103° F.; the pulse, 136; and the respirations 36 per minute. The face was pale; the heart and lungs were healthy; the urine contained no abnormal constituents.

The lower end of the left radius (the site of greatest tenderness) was exposed, but found to be quite healthy. A second incision was made over the ulna and some pus escaped when the periosteum was reflected. The lower two-thirds of this bone was resected. At the same time the left fibula was exposed and trephined, but no pus was found. Another incision behind and below the internal malleolus exposed the os calcis and tibia, but they appeared to be healthy. In order to allow free drainage none of the wounds were sutured.

On the day after the operation the temperature fell to 101° F., but the pulse and respirations remained as before.

The patient continued to complain of a good deal of pain, and required several doses of heroin.

On 3rd December a red tender swelling appeared around the left elbow, extending for 3 inches above the joint. The resection wound over the ulna was discharging freely. Two incisions were made over the upper part of the ulna and radius posteriorly, but no pus was found there. The joint was then opened from the inner side and a large quantity of pus escaped. A drain was inserted. Cultures of staphylococcus aureus were obtained from the pus. The temperature fell next day to 99° F.



The patient now complained of pain in the region of the right shoulder. Nothing could be made out, but by the next day (5th December) definite swelling and redness had developed at the outer end of the right clavicle. This was incised and drained. The temperature, which had risen to 101° F., fell again after the opening of this abscess. The temperature rose on 7th December to 102.6° F., but next day dropped again below 101° F.; the pulse and respiration rates also were both increased. Associated with this was a considerable discharge of pus from one of the incisions which had been left open on the sole of the foot. All the other wounds continued to discharge freely, and the patient's general condition remained much the same.

For several days there was little change in the patient's condition. The temperature continued to swing between 99° and 101°, and on the 12th dropped below 98°. The pulse and respiration rates also decreased slightly.

On the 14th December a large swelling was discovered on the outer side of the right upper arm. This burst and discharged freely, and the temperature, which had rapidly risen, dropped suddenly to normal. The patient now complained of pain in her right ankle and heel, but nothing abnormal could be made out in them.

On the 16th December there was a rapid rise of temperature to 102.4° F., the pulse reaching 146, and the respirations 44 per minute. No cause could be discovered for these, though pneumonia and pericarditis were carefully looked for.

The urine, which had formerly varied from 20 to 23 ozs. a day, now dropped to between 4 and 10 ozs. daily (onset of nephritis), and continued at these low figures until the patient's death.

The high temperature continued, and there were wide daily excursions (about 3°), the highest point being usually reached in the evening. The pulse and respirations remained rapid and the patient began to look very much worse.

On 23rd December the temperature touched 104° F., and the patient was very weak. The cardiac dulness was considerably increased from the presence of pericardial effusion. There was a good deal of coughing, and coarse crepitations could be heard all over the lungs. The conditions became worse, the cough increased, and on the 26th the cardiac sounds were muffled.

A soft, fluctuating boggy swelling (abscess) appeared round the left shoulder joint on 28th December.

On 29th December the patient became unconscious in the morning, got worse as the day advanced, and died at 7 P.M.

NOTES FROM THE POST-MORTEM EXAMINATION.

The body was greatly wasted. There were surgical wounds in the neighbourhood of the right shoulder, the left elbow, left forearm, outer side of left ankle, and the sole of the left foot. The left shoulder was swollen, and when opened pus was found in the joint cavity, in the neighbouring bursæ, and burrowing into the tissues around.

Half of the head of the humerus has been mounted to show the *erosion of the articular cartilage*, infiltration of the muscles and the medulla of the bone, as well as separation of the periosteum. The epiphyseal cartilage has also been destroyed, and the epiphysis has become detached to some extent from the diaphysis.

There was a small abscess at the inner end of the left clavicle (specimen mounted next to humerus). This has separated the epiphysis and has destroyed the periosteum.

In the right clavicle there are several pockets of pus, two of which appear to communicate directly with the medullary cavity of the bone.

The left elbow and the tissues of the forearm where the bone had

been removed were also infiltrated. In the centre of the jar (M. B. 553) is a piece of skin and muscle from this region, showing numerous small pockets of pus throughout the muscle.

The bones around the left ankle joint have been laid open. There is slight congestion near the trephine opening in the fibula, but the interior of the tibia is healthy. The astragalus has a very mottled appearance from the presence of yellow purulent areas which alternate with bands of congestion. The upper surface of the bone is eroded, and the various synovial cavities contained pus when they were opened. The other bones of the tarsus are not affected.

The pericardium (M. B., 554) was distended by a quantity of thick pus of a light buff colour. Tags of fibrin may be seen adhering to the pericardium, especially near the base of the heart. The rest of the pericardium is covered by a layer of exudate which has a slightly reddish tint, and appears to be undergoing organisation. There is a large abscess in the wall of the left ventricle (seen from behind).

Both pleural cavities were obliterated by slight adhesions. Scattered irregularly over the surface of the lungs are numerous small abscesses, which appear as pale yellow, rounded, raised areas. When the outer wall of one of these abscesses is removed a very irregular cavity is left.

On section the lungs are seen to be riddled with abscesses of varying size, which are larger near the surface. Here and there are dark purple areas of congestion and hæmorrhage.

The trachea is congested and full of dark brownish adherent mucus. The glands at the root are not greatly enlarged, but appear soft, congested, and œdematous.

Both kidneys were very pale and swollen. The portion mounted shows the remains of fetal lobulation, some general congestion of the surface, and pale raised areas which represent the abscesses.

On section numerous small abscesses are visible, for the most part arranged in lines running from the cortex towards the pelvis. There is only slight congestion of the mucosa of the pelvis.

The bladder, a portion of which has been mounted alongside, shows no naked-eye change.

The stomach was filled with "coffee-ground"-like material. There was no ulceration or erosion visible, but the surface was covered with blood-stained (brownish) mucus. The blood probably came from the lungs and was swallowed.

The liver shows fatty change.

The spleen is enlarged, and on section has a very mottled appearance.

MICROSCOPICAL FINDINGS.

Heart (Section A).—Over the surface of the pericardium is a layer of granulation tissue; in the outermost part of this are fragments of fibrin, stained pink with eosin, but for the greater part the fibrin has

been absorbed and replaced by a tissue consisting of many small thin-walled vessels which are seen to run up from the subepicardial vessels. Near the surface there are many cells irregularly arranged and mostly mononuclear in type (endothelial cells, lymphocytes, etc.), with a few of the elongated fibroblasts; deeper in there are more fibroblasts, some parallel with the vessels, others becoming arranged in layers at right angles to the vessels. In many of the small vessels polymorph leucocytes are visible, but they are scanty in the adjacent tissue. This is typical granulation tissue of about a week's formation. The van Gieson's stained section shows the commencing formation of fibrous tissue (pink) by the fibroblasts.

In the adjacent muscle the fibres are separated by oedema, and many are swollen and pale staining ("cloudy swelling"); in some cases actual breaking up of the fibres can be seen ("fragmentation").

In the section stained by Gram's method many Gram-positive cocci are visible in the superficial layers of the granulation tissue. The cocci are mostly in pairs, but small groups are also seen, and occasional short chains of three or four cocci. (Mixed infection; see note below on pericardial exudate.)

Lung.—A varied picture is presented in the sections. At the surface there is an organising pleurisy, with similar changes to those studied in the pericardium. In addition, at one part adhesions are seen between visceral and parietal layers of pleura. A large abscess cavity is seen lying beneath the pleural surface. Its walls are lined by granulation tissue with many leucocytes, polymorph and mononuclear; in its lumen are masses of necrotic tissue and leucocytes. The Gram-stained section shows Gram-positive cocci in the contents and in the walls.

In the lung tissue adjacent various changes are seen; some alveoli are filled with coagulated serous effusion, some with blood due to hæmorrhage from the capillaries of the walls, some have a cellular exudate of polymorph and mononuclear cells.

There are several abscess cavities filled with necrotic cells and leucocytes. Some alveoli around are packed with polymorph leucocytes, and in the Gram section these areas show great numbers of Gram-positive cocci in masses (staphylococci) and chains (streptococci). In the abscess and in their walls are great collections of cocci, seen with the low power as deep purple areas. Many small vessels are plugged with these organisms. The bronchi are in a state of acute catarrh, and many blood-vessels show leucocytes passing through their walls (emigration). Care must be taken not to confuse brown granules of deposit, due to the action of formalin on hæmoglobin, with organisms.

Kidney.—The sections show abscesses and intense toxic changes in the renal tissue. There is oedema, causing separation of the tubules. The convoluted tubules are most severely affected and show various

changes—some show swelling of the epithelial cells, with granular and hyaline droplets in their cytoplasm, and their nuclei in many instances show loss of chromatin staining; other cells are swollen and their cytoplasm is vacuolated. In many of the convoluted tubules the lumen is distended, and contains granular or hyaline debris and some desquamated epithelial cells. The collecting tubules are distended in most instances, but show much less alteration of their lining cells. The Malpighian tufts are congested, and in some there are red corpuscles lying inside Bowman's capsule. The intertubular capillaries are also congested. In one part of the section is a large, acute abscess cavity, with a zone of large phagocytic endothelial cells bounding it, while in its lumen are collections of polymorphs and endothelial cells amongst necrotic tissue; groups of cocci as darkly staining masses are visible, even with the low power, in this debris and in the wall in places.

In the Gram-stained section these masses of organisms are deep purple and consist of cocci. There is a small vessel plugged with a mass of cocci, and around is an infiltration with polymorph leucocytes; these are seen extending amongst the necrosing renal tubules.

Spleen.—There is general congestion of the pulp, and the Malpighian bodies are not clearly defined in many instances.

Careful examination with the high power is necessary for the study of the cytological changes.

The Malpighian bodies are small. The central arteriole shows in many cases hyaline swelling of its intima. Amongst the lymphocytes, which are not increased in number, are many large mononuclear cells, some derived from the reticular network, some from endothelial linings of lymphatic or blood-vessels. Mitotic figures can be seen in some of these cells. There are also cells resembling the large lymphocytes of the blood, and some with the morphological characters of "plasma" cells.

In the pulp the same types of cells are seen, but the large mononuclears predominate and many are phagocytic, containing debris of cells of various types in their cytoplasm. There are also a number of polymorph leucocytes scattered through the pulp. In the sinuses of the pulp the large mononuclear cells are also much in evidence, and the cells of the lining endothelium are swollen and in many places are becoming detached and enter the blood-stream.

In one or two small capillaries plugs of cocci—Gram-positive—are visible, and there is practically no cell reaction around these.

Tissue Removed from One of the Operation Areas in the Bone.—The section shows an abscess wall, with portions of bone lying adjacent to it, also fibrous tissue and muscle.

The abscess wall is ragged and consists of great numbers of cells, some of which are polymorph cells, others large mononuclear cells, many showing phagocytosis; intermingled with these are red blood corpuscles, and, in the Gram-stained section, are seen many masses of

cocci. Care must be taken not to confuse particles of chromatin of the cell nuclei with organisms.

Astragalus.—A portion of the astragalus was decalcified, and a section of this shows collections of pus cells in the marrow spaces and marked engorgement of the blood-vessels. Portions of bone are scattered about, many showing ragged edges from the absorption that has been occurring.

The pus examined from the sternoclavicular and shoulder joints showed the presence of large numbers of staphylococci. In films from the pericardium, in addition to the staphylococcal forms, a few of the organisms were arranged in chains. *Staphylococcus aureus* was cultivated from all these regions. The peritoneal fluid, which was scanty and quite clear, also gave a growth of staphylococci and of some cocci, which resembled streptococci, arranged in pairs and short chains. The staphylococcus was also obtained in pure culture from the urine got from the bladder.

DISCUSSION.

The terms septicæmia and pyæmia have not yet been clearly defined, and as various interpretations are employed by different authors, a short discussion of the subject will help the understanding of this case. In both conditions living organisms are present in the blood, but in the case of pyæmia they are also able to settle in the tissues and give rise to abscesses. *Septicæmia* then simply means a condition where organisms are present in the blood, and takes no note of whether they are merely mechanically carried by the blood or are able to multiply in it. In the more strict pathological sense "septicæmia" is used where the bacteria have gained a footing and are multiplying in the blood, the condition of simple mechanical carriage being spoken of as *bacteriæmia*.

It is doubtful if septicæmia in its narrower sense ever occurs in man, except in cases of septicæmic plague, where there appears to be a true multiplication of organisms in the blood. Most cases of so-called septicæmia are really conditions where there is an escape from some local focus into the blood, without the organisms being able to increase in the circulation.

There is a similar discrepancy in the use of the word *pyæmia*. As distinguished from septicæmia, it is employed where multiple abscesses are produced throughout the tissues from the settlement of organisms brought by the blood. Here, again, there is no consideration of whether or not multiplication is occurring in the blood. In most cases of pyæmia, where the tissue vitality has become so reduced as to permit of the formation of local foci, the bactericidal capacity of the blood will have been used up, and the organisms will be able to flourish in it.

It sometimes happens that the bacteria enter the circulation from



FIG. 1. — *A.* Section through the Left Foot. There was general congestion of the bones and arthritis of the ankle-joint; (*c*) lower end of fibula showing bare bone around which was an abscess; (*b*) the ankle-joint; the surfaces are irregular from the destruction of cartilage; (*e*) astragalus showing white points of suppuration throughout the cancellous tissue; (*d*) arthritis of tarsal joints. *B.* Left Clavicle. The inner end was surrounded with inflamed tissue and pus.

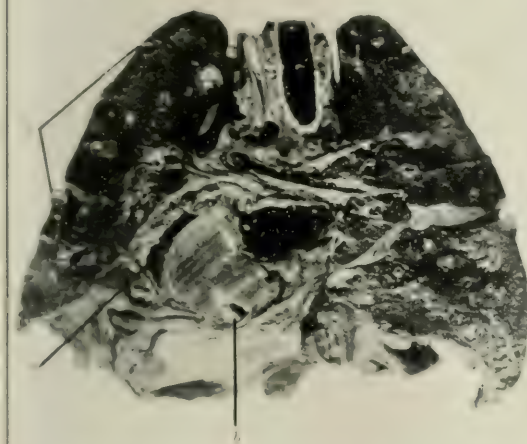


FIG. 2. — Section through Lungs and Heart. (*a*) Abscesses in the lung; (*b*) opacities in the heart wall; (*c*) exudate from pericarditis.

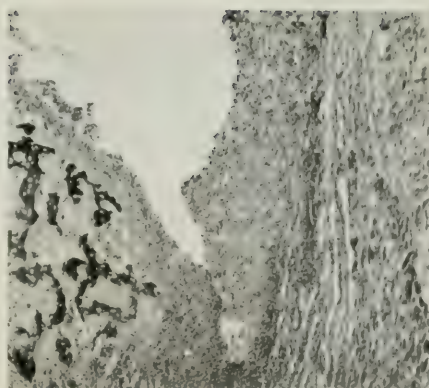


FIG. 3. — Microscopic Section of Piece of Bone showing the Site of a Periosteal Abscess.

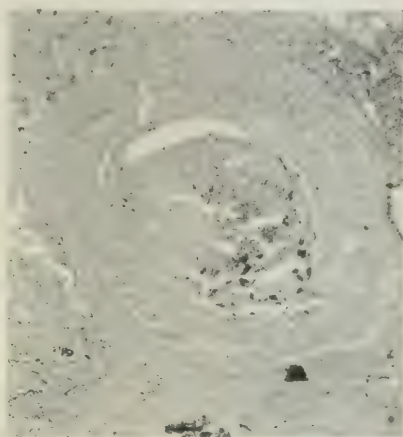


FIG. 4. — Microscopic Section of an Abscess in the Lung formed around a Thrombosed Vessel. Colonies of staphylococci are seen as black masses.

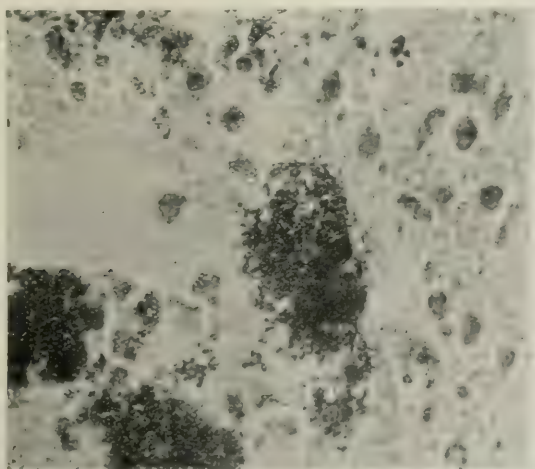


FIG. 5. — Portion of the same Area as that seen in 4 under Oil Immersion: colonies of staphylococci.

a primary focus and are unable to grow in the blood, but when they have reached a favourable site in the tissues where the local resistance may be lowered, they can at once multiply and give rise to an abscess. There is no special name to differentiate this condition from the other, and, clinically, it would be classified under pyæmia.

No hard-and-fast rule can be laid down regarding the use of these terms; the conditions are similar and simply differ in degree, depending on the relative virulence of the infection, the amount of antibodies in the circulation, and the resistance of the tissues.

Toxæmia is used to signify the group of symptoms which are due to the presence of *bacterial products* in the blood. Severe toxæmia may exist where the bacteria are strictly localised, as in tetanus and diphtheria, and, on the other hand, toxic symptoms are also constantly present in septicæmia and pyæmia where the organisms are not restricted to one focus.

The first point for consideration in this case is the origin of the infection. When admitted to hospital on 30th November the patient said she had not been feeling well for a few days, but did not complain of her ankle until the 27th (3 days before). No history of any injury could be obtained, but it is possible that the organisms may have gained access to the body from a small furuncle or by some slight abrasion which was insufficient to attract attention. This slight breach of the surface may have been on any part of the body, not necessarily in the neighbourhood of the primary focus. On the other hand, the organisms may have entered the system from the alimentary or respiratory tracts. It seems highly probable that organisms may frequently enter the body in this way, but if the subject is in good health they are at once destroyed. In the absence of any definite injury cases of *septicæmia* (such as this one) must be accounted for by some special virulence of the organism or by a lowered resistance on the part of the patient.

A few days before patient was admitted to hospital organisms were being poured into the circulation from some local focus. Many of them would be destroyed, but a few surviving were carried to the bones. At this early stage the condition was one of *mechanical septicæmia*, and there is no evidence to suggest that any multiplication was occurring in the blood. Most of the organisms reaching the circulation would be acted upon by the antibodies in the fluid—opsonins, etc.—and engulfed and destroyed by the leucocytes. A few, escaping this, would be scattered throughout the body, and might become caught in the minute capillaries of the tissues. In most of the organs the bacteria are destroyed and no lesion results, but in children, for some reason as yet undiscovered, staphylococci often settle down and multiply in the bones. There is not the same tendency in adults for osteomyelitis to follow such an infection. It is difficult to give any satisfactory explanation for the special affection of the bones in such

cases. *A priori* the great vascularity of the marrow and the presence in it of enormous numbers of blood-cells would suggest that the organisms would be unlikely to settle in this situation. In spite of this, there is apparently some local factor which predisposes the growing bones to staphylococcal infection. Compare in this connection the special tendency for the pneumococcus to attack the lungs and serous membranes (D. B., 5; M. B., 38), the micrococcus rheumaticus the joints and heart valves, and for *B. coli* to cause lesions of the urinary tract and some other mucous membranes.

The activity of the organisms appears to be restrained so long as they remain in the circulation, and they give rise to abscesses only when they are not in circulating blood. Many organisms are taken up by the phagocytic leucocytes, some of which then leave the capillaries for the lymphatic or tissue spaces. The organisms may then overcome the leucocytes and begin to multiply in the tissues. Miliary tubercles probably arise in this manner. Organisms may also be arrested by the clumping of red corpuscles and fibrin threads around them, as has been proved to occur in inoculation experiments on animals. These masses block the capillaries, which are then shut off from the circulation, and abscesses are now formed by the multiplication of the bacteria. Where larger clumps of organisms are present in the blood they may of themselves be sufficient to obstruct the capillaries.

In the present case the ulna and astragalus were probably affected about the same time, but, although the suppuration process was more advanced in the ulna, attention was earlier directed to the ankle, because of the proximity of several joint cavities to the suppurating focus. In acute osteomyelitis, as in cases of tuberculous infection, the organisms usually settle first beside the epiphyseal cartilage at the end of the diaphysis—the termination of the nutrient artery. The vessels in this region being end arteries may lend themselves to the settlement.

There the local phenomena of inflammation at once appear. Vascular dilatation, stasis, and the emigration of leucocytes are followed by destruction of tissue and the formation of pus. Definite abscesses may be produced (as in clavicle in this case), or, more commonly, a diffuse infiltration of the interior of the bone occurs—see astragalus and humerus. At the same time the infection frequently spreads through the dense bone, and involves the periosteum. This occurred at the neck of the humerus, and also in the case of the ulna. Where pus is formed in the medulla and under the periosteum, the intervening piece of bone dies, and is gradually separated as a “sequestrum” from the living tissue; there was no time for this process to occur in this case.

In the present case other foci of suppuration soon appeared in different bones, and these may have been due to the initial septi-

cæmia or to reinfection of the blood from the earliest bone lesions. The charts attached to this case illustrate graphically the general condition produced in acute suppuration. As each successive abscess developed the temperature rose abruptly, and with it there was an increase in the pulse and respiration rates. As soon as the abscess was incised and free drainage of pus was established these figures rapidly fell. The fever, acceleration of heart and breathing, and other symptoms such as headache, rigors, and delirium, which may also occur, are to be attributed to the toxæmia which always accompanies septicæmia—the poisons being chiefly produced by the organisms settled in the tissues rather than by those still free in the blood. When the abscess is evacuated the store of toxin is also discharged, and though the production may continue, very little is absorbed by the body. Hence the toxic symptoms are much less when the cavities are draining freely.

The case continued simply as one of multiple osteomyelitic disease until 15th December, 18 days after the appearance of the first lesion. During this time a certain number of organisms were escaping into the blood-stream, but were being held in check by the natural resistance of the body. At the same time the patient was being gradually poisoned by the bacterial toxins. Strictly speaking, the condition could hardly be termed pyæmia.

On the 16th December her symptoms suddenly and rapidly became worse, and at first no cause for this could be discovered. Up till this date the tissues had been able to destroy any organisms which chanced to reach them, but after this point abscesses began to form in the internal organs. This may be accounted for by all the available antibody in the blood having been used up, or by the vitality of the tissues being reduced by the toxæmia, or again by the bacteria being carried to the organs in too large masses to be dealt with (septic emboli). Thrombi are very liable to be formed in the smaller veins near inflammatory foci, and these soon become infected. As softening occurs in the clot from the action of the bacterial products and cellular enzymes, pieces may become broken off, and are carried by the veins to the right side of the heart and become impacted in the capillaries of the lungs. Here inflammatory reaction is produced and definite abscesses are formed. The relation of the abscesses to the vessels cannot clearly be made out in the microscopic sections, but some of the veins in the immediate neighbourhood are thrombosed and contain large numbers of organisms. Once the infection has reached the pulmonary veins it is easy to see how septic emboli may be carried to the left side of the heart and be disseminated throughout the systemic circulation. Secondary pyæmic abscesses may be found in almost any tissue. In this case they are seen in the heart and kidneys, and the serous cavities had also become infected.

With the appearance of large numbers of new abscesses the tox

æmia increased. The gradual and persistent rise of temperature and the greater severity of the symptoms were due to the continuous absorption of a large amount of toxin from the enclosed abscesses.

The effects of the toxæmia are seen in the various organs, the heart, liver, and kidney being pale from the presence of cloudy swelling. In the case of the kidney the condition has advanced somewhat further, and the toxæmia has produced a well-marked acute nephritis which has affected the parenchymatous cells. Note the sudden fall in the amount of urine secreted after the 16th December, which probably indicates the date of onset of the nephritis.

Death was due to toxæmia and exhaustion, and was accelerated by interference with cardiac action by the pericardial effusion and the large abscess in the heart wall.

The staphylococcus pyogenes aureus was cultivated from the pus during life and also at the post-mortem from various situations. In addition to this, colonies of streptococcus were obtained from several places, and some of the organisms found microscopically in the lung are arranged in chains. This suggests that there was a mixed infection, at least in the terminal stages of the condition. The streptococci probably gained access to the tissues after the general resistance had been lowered by the staphylococcal disease.

To recapitulate shortly—the condition began as a septicæmia, with staphylococci in the circulating blood. This was followed by acute osteomyelitis in several of the bones, and after a rather long interval (18 days) general pyæmia occurred with the formation of the abscesses in the internal organs. Throughout the disease there was a varying degree of toxæmia, which can be followed graphically on the temperature chart.

This Case Illustrates—

The difference between *septicæmia* and *pyæmia* and the relation of these to *toxæmia*.

The possibility of the occurrence of *cryptogenetic septicæmia*.

The tendency in young persons for staphylococci to settle in the bones (osteomyelitis), and the apparent *immunity* of the other healthy tissues to attacks of the micro-organism.

The increase of fever associated with the absorption of *toxin* from a developing abscess, and the *sudden fall* which follows evacuation and free drainage.

The susceptibility of tissues, *devitalised by prolonged toxæmia*, to the attacks of organisms to which they were formerly immune.

The development of pyæmia as a sequel to osteomyelitis.

The production of acute nephritis in a case of severe toxæmia.

For permission to publish the clinical account of this case I have to thank Mr. D. P. D. Wilkie, M.D., Ch.M., F.R.C.S.E.

D. MURRAY LYON.

PRIMARY MALIGNANT ADENOMA OF THE LIVER
SIMULATING TROPICAL ABSCESS.

By MAJOR D. G. MARSHALL, I.M.S.,

Lecturer on Tropical Diseases in the University of Edinburgh.

IN cases where there is reason to suspect the presence of a tropical liver abscess, diagnosis often presents a most troublesome problem. To quote a French writer, "It is a hundred times more difficult to diagnose a tropical abscess of the liver than to open it."

In doubtful cases it is advisable to bear in mind that patients from the tropics, presenting signs of affection of the liver, may be suffering from diseases not necessarily limited to the tropics. The importance of recognising these points is shown in the case here recorded.

The case was seen on the 22nd January 1914 at the request of Mr. Cathcart, who thought the patient was probably suffering from an amœbic abscess of the liver.

Previous History.—The patient, 34 years of age, had been working as a medical missionary in Rhodesia for some years. Excepting occasional attacks of malaria, he had enjoyed good health; no history of dysentery.

He came home on leave in the autumn of 1913, and shortly afterwards commenced to suffer from slight pain on pressure in the region of the liver. About the end of December, following exposure to chill, the pain became more severe and was accompanied by rise of temperature in the evenings (99° - 99.4° F.). The patient was confined to bed for a few days.

Examination.—The patient, a strong, well-developed man, did not complain of any marked symptoms. He had, in fact, arranged to return to Rhodesia early in February. Tongue clean, no jaundice, heart, lungs, and spleen normal.

Percussion showed the liver dulness extending two inches below the costal margin and measuring 8 inches in the mammary line. On deep palpation the under surface of the right lobe was felt to be slightly nodular.

Blood normal, excepting slight increase in large mononuclears. Leucocytes, 6000.

Examination of the stools for amœbæ and ova was negative. A skiagraph of the liver area simply showed the marked enlargement of the liver, no diminution of movement of the diaphragm on the right side.

The patient was kept under observation for a fortnight. The

temperature during this period was never above normal. There was a daily marked increase in the liver dulness with persistent pain. The case was now diagnosed as one of malignant disease, probably sarcoma, on the following grounds:—Cirrhosis, alcoholic or specific, could be excluded by the history; malarial cirrhosis, kala-azar, or Banti's disease, by the absence of corresponding enlargement of the spleen; hydatid, or other parasitic affection, by the absence of eosinophilia, and non-detection of ova in the stools. As all other causes of enlargement of the liver could be excluded, the diagnosis now lay between liver abscess and malignant disease.

In tropical abscess it is very common to find that for periods of a fortnight or more the temperature remains normal, therefore the absence of fever in this case had no great significance. On the other hand, though in sluggish, deep-seated abscess there may be a normal blood-count, leucocytosis (16,000-18,000) is almost invariably present in acute abscess formation. Taking these facts into consideration and also the rapid increase in the size of the liver, with the irregularity of the surface felt on palpation, we felt justified in making the above diagnosis. This was, of course, not communicated to the patient, and as he was anxious for something to be done, the liver was thoroughly explored with an aspirator on 7th February; only blood was obtained, and this under the microscope revealed nothing abnormal.

A few days afterwards the patient proceeded to London on a short visit. On his return (22nd February) the condition was found to be distinctly worse. There was marked prominence over both right and left lobes of the liver. The dulness on the right side measured eleven inches in the mammary line, the spleen was found to be slightly enlarged.

He complained of persistent pain, loss of appetite, and general weakness, and after a few days was confined to bed.

28th February.—There has been a regular rise of temperature in the evenings (99°-100° F.), with pronounced increase in the area of liver dulness. As the patient still clung to the opinion that he was suffering from abscess of the liver, and was anxious for further exploration, laparotomy through the right rectus was performed. The surface of the liver was found to be irregularly nodular, with numerous striae of fibrous tissue on the surface. A small portion of the liver was excised. Sections (stained with hæmatoxylin and eosin) showed the characteristic features of a rapidly growing primary malignant adenoma (Figs. 1 and 2).

The growth spread generally in finger-like processes. In some

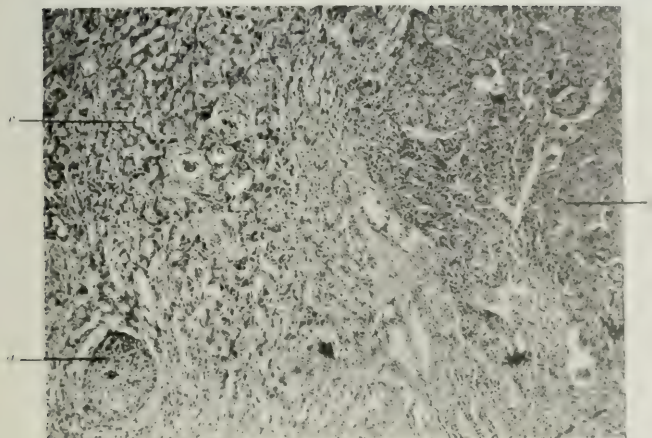


FIG. 1.—A. Small nodule of new growth.

B. Large area showing the general arrangement of the cancer cells, irregular columns, between which are seen the open blood channels with practically no supporting connective tissue.

C. Zone of liver tissue showing columns of atrophied liver cells, between which are distended and engorged capillaries. ($\times 40$ diam.)

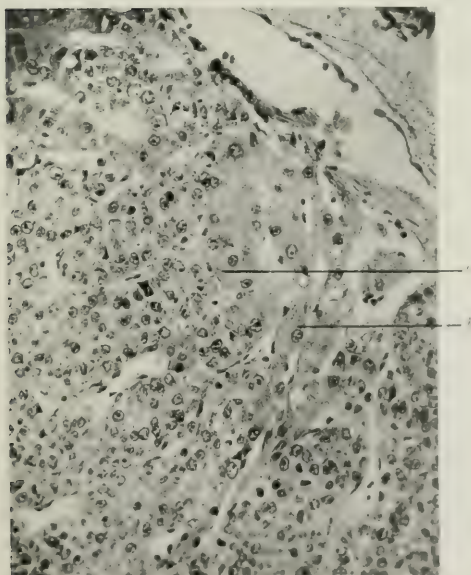


FIG. 2.—Showing Character and Arrangement of the Cancerous Cells; these are closely packed and arranged in irregular columns; between are seen the thin-walled capillaries. At (a) is seen the sharp blending between the cancer cells; and (b) the more healthy liver cells. ($\times 150$ diam.)

areas it formed irregular masses. The liver cells unaffected by the growth were undergoing fatty degeneration. The portal tracts did not show any marked change, and there was no evidence of cirrhosis.

After the operation the patient rapidly lost ground, there was irregular fever, disturbed nights, the liver rapidly increased in size, especially the left lobe, and there was some difficulty in breathing, evidently due to pressure on the lungs.

He was allowed to go to his friends in the north on the 10th March. He died on the 15th April, less than three months from the date he was first examined.

Dr. Pyle of Portmahomack, Ross-shire, who attended the case during the concluding stages, has kindly furnished me with the following particulars:—"There was not much change in the condition of the patient until the beginning of April, when he commenced to lose ground rapidly. The area of liver dulness increased steadily. On the right side it extended to two inches below the umbilicus, over the left lobe it reached the nipple line laterally and extended upwards to the clavicle. For a time there was no difficulty in breathing, but towards the end there were some rather severe attacks of dyspnoea, and a troublesome cough, with expectoration of foul-smelling, blood-stained material. There was little jaundice, the stools were always normal in appearance. There was some oedema of the feet and ankles, and, shortly before death, a curious localised oedema of the right side was noted. It involved the lower part of the abdominal wall, the buttock, and the thigh as far as the knee; it was very pronounced and pitted to the depth of an inch on pressure.

"In the scar of the first operation a few secondary nodules appeared; the floor of the second operation wound, which never healed, presented a gangrenous sloughing appearance."

Primary cancer of the liver is a somewhat rare condition. Those interested in the subject are referred to an article by Lindsay S. Milne,¹ in which several cases are fully described and well illustrated. Milne states that up to 1901 accounts of only 163 cases had been published, and since that time about 50 more.

Since this case did not show any signs of cirrhosis of the liver it is interesting to note some observers have stated that in 86 per cent. of the published cases the condition was associated with cirrhosis, while one German writer goes the length of asserting that cirrhosis is the primary condition, and that the malignant growth is always a secondary one.

THE PRACTICE OF MEDICINE IN THE DAYS OF MOLIERE.

By J. BARFIELD ADAMS, L.R.C.P., L.R.C.S.,
Member of the Medico-Psychological Association.

JEAN-BAPTISTE POQUELIN, better known by his stage name of Molière, was born at Paris on the 15th of January 1622. His father, who was an upholsterer, intended that his son should be brought up to the same trade, and early initiated him into the mysteries of the business, being content that the boy's general education extended little beyond reading, writing, and simple arithmetic.

But like Corot, another Parisian genius, who lived a hundred and eighty years later—another Jean-Baptiste by the way—the young Poquelin showed little aptitude for petty commerce, and was presently rescued from the drudgery of the shop. At the age of fourteen, by the advice of his grandfather, he was sent to the Jesuit College of Clermont, known later as that of Louis-le-Grand. Here he remained five years, studying philosophy and the humanities, the usual curriculum of those days, chiefly under the tuition of the celebrated Gassendi.

Tradition says that on leaving college there was some thought of his entering the Church. But if this idea were ever seriously entertained, it was soon given up, and young Poquelin was sent to study law at Orléans, from which city he returned to Paris in 1645, and was received advocate.

The results of this education can be traced throughout the works of the dramatist. His acquaintance with Greek and Latin authors and with philosophy, both ancient and modern, constantly reveals itself; while his knowledge of law is shown by the frequent and correct use of legal phrases, by the notary's exposition of the law of marriage settlements in *L'École des Femmes*, and especially by De Bonnefoi's summary of a person's testamentary powers under the ancient *Coutume de Paris* in *Le Malade Imaginaire*.

It is clear, then, that Molière studied Law; there is a suspicion that at one time his attention was directed towards Theology, but there is no evidence that he ever studied Medicine. Yet his acquaintance with the anatomy, physiology, and therapeutics of the age was by no means superficial, and among the characters which crowd his stage—courtiers, blue-stockings, jealous husbands, soubrettes, lovers, and doctors—the latter stand in the first rank.

Whence, then, came Molière's knowledge of things medical and his skill in painting the portraits of the physicians of his day? The great playwright's ill-health gives the answer to the question. He had studied the doctor from the patient's point of view.

Do we not sometimes forget, when we are at the bedside of a sufferer, that while we are studying the case the patient is studying us? Some, no doubt, are not intelligent enough to observe much; others, the majority probably, are so lost in the egotism of disease as to take little notice of anything but themselves; but there are a few who see and think, and they are not found only among the educated classes, for as there are "village Hampdens and Cromwells guiltless of their country's blood," so there are humble Shakespeares and Molières whose fancies have never materialised in puppets which strut their little hour on a stage. These pain-stricken men and women are born psychologists. Those patient eyes—patient like those of a dumb animal—that watch us from a bed of suffering, are often reading us to the very bottom of our souls. They note our vanity, our self-importance, our pride of learning and of our manual skill, and sometimes—but publish it not in the streets of Askelon—our ignorance. Let us add that sometimes, too, though that is only among those who are at once the best and the humblest of us, they note our love for poor humanity.

The chronic disease from which Molière suffered is said to have commenced with a neglected cough, which was followed by an inflammation of the chest. From this illness he never seems to have completely recovered, for he suffered from spitting of blood to the end of his days, and died at last of an attack of profuse hæmoptysis. It is astonishing that such a valetudinarian should have continued to live so arduous a life. He was author, actor, and courtier. There must have been a strong spirit in that frail, earthen vessel! But he was only able to carry out his manifold labours by following the strictest regimen. For years, it is said, he confined himself almost entirely to a milk diet. There is something pathetic in the picture of the great comedian entertaining the brilliant circle of guests, which gathered around him in his country house at Auteuil, at a table loaded with rich wines and dainty meats, while he partook of his meagre fare.

We are told that about six months before his death Molière ceased to follow these rigid rules of dietary. His relations with his wife had not always been happy, and in order to effect a

reconciliation between the pair, his friends, for some obscure reason, persuaded Molière to give up his simple food and return to a more generous mode of living. It is said that this change was followed by a great increase in the cough and the other symptoms of his disease.

If we except some early dramatic sketches, written when he was a young man touring the southern provinces of France with a wandering theatrical company, and in which the physician, who figures among the characters, was probably little more than the comic doctor so familiar on the Spanish and Italian stage of the period, we find only trifling references to medicine—such as liquorice juice being used to relieve a cough, or hellebore being administered for its soothing properties—in Molière's works before *L'Amour Médecin*, a play which was produced in 1665.

It is difficult to fix the date of the commencement of the comedian's long illness, but it was certainly before the year 1666, when *Le Misanthrope* appeared. So that, considering the nature of the disease, we cannot be far wrong in assuming that doctors had begun to figure largely in his life in 1665, the year in which, as we have seen, *L'Amour Médecin* was written. Afterwards, physicians and apothecaries crowd the scene in such plays as *Le Médecin malgré Lui*, *Monsieur de Pourceaugnac*, and in the immortal *Le Malade Imaginaire*.

The plot of *L'Amour Médecin* is very simple. It turns on the ill-health of a girl, whose father will not allow her to marry the man with whom she is in love. She suffers from a mixture of sulkiness and hysteria, a condition which is not unknown even at the present day. Alarmed by a real or pretended fainting fit, the father calls in four eminent physicians. His maid-servant, who appears to have a poor opinion of the members of the medical profession, objects to the number.

"Is not one doctor enough to kill one person?" she asks.

But her master replies that one cannot have too many doctors for such a serious case.

The four doctors who figure in this play are said to be caricatures of the four leading physicians of Louis XIV.'s court, and Molière conceals their identity under names made up of Greek words, which express their favourite methods of treatment or their physical defects. One practises phlebotomy to excess, another gives emetics to all his patients indiscriminately, a third speaks with great slowness, scanning his words in a way which must have set a quick-witted Frenchman's teeth on edge, and a

fourth stutters and stammers to such an extent that it is impossible to understand what he says.

Having examined the patient, the doctors meet for consultation. Before leaving them to pursue their deliberations in private, the father hands to each one his fee. He admits that this is not the custom, but he does so, he says, lest he should forget the pleasing duty when they go away. One cannot too much admire the old gentleman's breach of etiquette, and one would wish that it occurred occasionally at the present day. One has met with cases in which the friends have been so overcome with their anxiety for the patient that they have omitted to hand the physician his honorarium.

After some preliminary coughing the consultation commences by the two leading doctors explaining to their colleagues how exceedingly busy they are at that moment. Then the conversation turns on a case which has nothing at all to do with the one in hand. Indeed, it seems probable that the latter would never have been touched upon if the father had not come into the room to say that his daughter was very much worse, and that he would be glad if they would make haste and tell him what was to be done.

The two leading physicians cannot think of speaking the one before the other. The anxious father begs them to put ceremony aside, and to think of the patient. Immediately all four begin to speak together.

"Gentlemen, I beg you, speak one at a time," exclaims the father.

Upon that, the doctor who believes in phlebotomy advises immediate and copious bleeding, and the other, who prescribes emetics on all occasions, advocates the administration of his favourite remedy. Each gives his reasons for the treatment he proposes, and they argue with such warmth that in a few minutes they come to angry words, charging each other with having killed many of their patients by wrong treatment. Finally, the quarrel reaches such a pitch that the two learned gentlemen take their departure in high dudgeon, each, as he goes out of the room, warning the father that if his advice be not followed the patient will certainly die.

Finding it impossible to follow two opposite opinions the afflicted parent turns to the physicians who have remained behind and begs them to tell him what is to be done. These worthies advise him to the best of their ability, though they are careful not

to commit themselves either in the way of treatment or prognosis. But the one speaks so slowly and the other stutters so much that it is difficult to make head or tail of what they say.

In the end the bewildered father bows them out very politely, though in saying adieu he cannot refrain from mocking their modes of speech.

In a comic play one expects caricatures, but one cannot read the private letters of the period—and the reign of Louis XIV. was the golden age of letter writing—without realising that Molière exaggerates very little in the portraits which he draws of the medical men of his time.

It appears that the doctors took the dramatist's raillery in good part, for in his preface to *Le Tartuffe*, in which he protests against the resentment with which the hypocrites received that play, Molière says: "The marquises, the blue-stockings, the jealous husbands, and the physicians have suffered good-humouredly the way they have been represented on the stage, and they even seem to have been diverted like everybody else at the portraits which one has made of them."

Indeed, the comedian appears to have lived on excellent terms with the members of the medical profession. Whatever may have been his opinion of their skill, he was their friend in many ways. On one occasion he solicited from the King a vacant canonry of the royal chapel at Vincennes for the son of his own doctor, and the request was granted.

Speaking of this physician, whose name was Mauvilain, the King one day said to Molière: "You have a doctor, then; what does he do to you?"

"Sire," replied the dramatist, "we talk together. He prescribes medicines for me. I do not take them. And I get well."

But to return to *L'Amour Médecin*. Disgusted with the regular practitioners, the distressed father turns to the quacks.

The quack (*opérateur*) was a familiar figure in the streets of Paris in those days. He set up his trestle table wherever he could find a suitable position, and from this elevation he extolled in a stentorian voice the virtues of his remedies, which were, no doubt, as efficacious as those prescribed by the faculty. He was usually accompanied by one or two mountebanks as assistants, and also by trained monkeys, educated pigs, and other performing animals, on whose tricks he could fall back when his professional harangues failed to attract public attention.

It was to one of these individuals that the anxious father went

to buy a box of Orvietan. This was an electuary, sometimes called Venice Treacle, which was invented by Girolano Ferranti, a native of Orvieto in Italy. It was a secret remedy, and was composed of many ingredients. Readers of Sir Walter Scott will remember the chapter in *Kenilworth* which describes the number and character of the apothecaries' shops which Wayland Smith visited when he wished to purchase the drugs necessary to make the electuary in question. It had a great reputation both as an antidote for poison and as a remedy for disease.

The charlatan in *L'Amour Médecin* chants its virtues as a cure for the itch, the scab, the scurf, fevers, the plague, the gout, the pox, rupture, and measles. Truly it was a cure-all.

We have no opportunity of knowing the effect of this marvellous remedy on the hysterical young lady, for when her father returned home he found another doctor ready to undertake the case. This was the girl's lover disguised as a physician. Naturally, he was able quickly to cure the patient, and the story ends happily.

Le Médecin malgré Lui is probably the best known of Molière's plays. Some of the phrases which occur in it, such as *Il y a fagots et fagots* and *Mais nous avons changé tout cela*, have become proverbial. And further, those of us who, in our moments of leisure, have rummaged among the forgotten dramas of the Georgian period, will remember that Fielding adapted this comedy for the English stage under the title of *The Mock Doctor*.

The plot of *Le Médecin malgré Lui* is merely a variation of that of *L'Amour Médecin*. But in this play the heroine is downright shamming. Even the politeness due to the *beau sexe* will not allow us to say that the mutism from which the young lady pretends to be suffering is hysterical aphonia.

However, her father became alarmed at his daughter's feigned disorder—a woman's loss of speech naturally strikes one as a serious matter—and called in several celebrated physicians. These gentlemen having failed even to understand the disease, he sends his servants to search for a quack who would be clever enough to cure a malingerer. The servants, while on their quest, meet with a woman who wishes to revenge herself upon her husband, a woodcutter or faggot-maker, for a beating that he has just given her. Hearing the servant's story of their errand, she seizes the opportunity, and tells them that a quack, or, as she puts it, a very clever but eccentric physician, lives close by. His foible is, she says, to dress like a peasant and to employ his time in

making faggots. He will refuse even to acknowledge that he is a doctor, much less to go and see a patient, unless they beat him.

The servants meet Sganarelle, which is the name of the wood-cutter, beat him, and so induce him to come and see their master's daughter.

Molière is careful to inform us that Sganarelle in his youth was for six years the servant of a celebrated physician, and in this way he accounts for a peasant having a smattering of anatomical knowledge, and being familiar with the names of Aristotle and Hippocrates, into whose venerable mouths he puts some rather extraordinary statements.

Sganarelle, dressed in a doctor's gown, visits the patient and her father, and having ascertained that the latter is ignorant of Latin, treats him to string after string of incomprehensible jargon. The remedies which he prescribes have the virtue of harmlessness in spite of their absurdity, but possibly he would not have been able to effect a cure if on his second professional visit he had not taken the young lady's lover with him in the character of an apothecary, having been handsomely bribed to lend himself to the deception. It is needless to add that the apothecary was more successful in his treatment than the physician.

The incident of seeking a quack doctor among the labouring classes is by no means improbable. At that period, and for many years after, irregular practitioners of medicine swarmed throughout Western Europe, and their numbers were principally recruited from the peasantry. Occasionally they were stupid people, more stupid even than their dupes, but generally, as in the case of Sganarelle, they were well endowed with mother-wit, and quite capable of taking advantage of the credulity of others. There is also ample evidence in the literature of the age that their advice was frequently sought for by persons of position and education.

I have before me the copy of an engraving by Hübner, dated 1774, that is more than a hundred years after the appearance of *Le Médecin malgré Lui*. It represents Michel Schuppard, a Swiss peasant who was a celebrated quack doctor in his day, seated in a room of his cottage, the walls of which are lined with shelves, on which are arranged countless bottles, boxes, and paper parcels containing the drugs and simples employed in his craft. The old peasant is holding in his hand a flask filled with urine, from the appearance of which he diagnoses the disease from which his patient is suffering. Immediately opposite the quack doctor is

seated a fashionably dressed lady, behind whose chair stand two equally fashionably dressed gentlemen, whose gestures express amazement at the skill of the untaught physician.

Sganarelle's knowledge of anatomy is on a par with that of a certain lady patient of mine. She very good-naturedly saves me all trouble in the way of diagnosis when I am called in to attend her. She is quite sure of the nature of the disease from which she is suffering, so that there is no more to be said about it. When she describes the way in which the "wind" circulates among her abdominal and thoracic organs and ascends to her upper story she always reminds me of Sganarelle's learned account of the same physiological phenomenon.

In the comedy of *Monsieur de Pourceaugnac* Molière gives us the opportunity of learning something of another branch of the practice of medicine in his day. The story runs as follows:—

A certain wealthy citizen of Paris determined to give his daughter in marriage to Monsieur de Pourceaugnac, a legal gentleman of the city of Limoges. Upon the latter's arrival in Paris the young lady's lover, with the help of a Neapolitan scoundrel, manages to inveigle him into what is perhaps best described as a private madhouse, assuring the proprietor of the establishment that he, the lawyer, is of unsound mind and requires treatment.

The physician in whose care Monsieur de Pourceaugnac is thus placed does not confine himself to one speciality. He is a general practitioner of medicine as well as an alienist. An apothecary speaks with admiration of the promptness which characterises his methods of treatment. He has known, he says, some patients of this doctor who "have died in less than four days, and who, if they had been in the hands of another practitioner, would have languished more than three months."

This physician and another older, but equally celebrated, doctor hold a consultation about the case of the legal gentleman from Limoges. Allowing something for exaggeration, we can obtain from the conversation of these worthies an idea of the state of mental medicine and of the treatment of the insane, at least of the wealthy insane, in those days.

Melancholia appears to have been the primary conception of insanity, and was divided into three varieties. The first was due to disease of the brain; the second was a disease of the blood, and caused the liver to secrete black bile; the third, which was called hypochondriacal melancholia, and which was the form of mental

disorder diagnosed by the doctors in the case of poor Monsieur de Pourceaugnac, was caused by disease of the lower bowel and the other abdominal organs, particularly of the spleen. On this three-legged stool the alienists of the seventeenth century proceeded to pile up, pell-mell, a miscellaneous collection of diseases—mania, monomania, apoplexy, phrensy, and, curiously enough, phthisis, which appears to have been as fatal among the insane of those days as it is among such sufferers now—so that the whole resembled the scrap-heap which Kraepelin has dignified with the name of maniacal-depressive insanity.

The mental and physical signs of hypochondriacal melancholia were, we are told, a profound sadness accompanied by fear and distrust; the eyes were red and haggard; and the patient suffered from constipation.

Among the methods of treatment, as was perhaps natural in the days when nearly all disease was attributed to the development of noxious humours in the body, phlebotomy held the first place. The bleedings were to be frequent and plentiful. The surgeon was advised first to open the basilic vein. If that did no good, he was to open the cephalic vein, which, as its name indicates, was supposed to come directly from the head. If that failed, the frontal vein was to be opened, and the opening was to be large, in order that the thick blood might flow freely. At the same time copious evacuations were to be obtained by the administration of cholagogues, melanogogues, etc. In addition baths were prescribed, and the diet was to be confined almost entirely to preparations of milk.

One can hardly blame Monsieur de Pourceaugnac, whose health was really good, and who enjoyed an excellent appetite, for escaping as soon as he could from the doctor's house. However, the young lady's lover had other traps laid ready, and in the end he succeeded in defeating his rival from Limoges.

In the first scene of *Le Malade Imaginaire* we see Argan, the old man who imagines that he is seriously ill, going over a bill which he has just received from his apothecary. It is a tremendous bill, and the items are given with a wealth of detail. What particularly astonishes the modern reader is the number and the composition of the clysters which have been ordered for the patient. No wonder that in old prints the apothecary is so frequently represented as being armed with a huge syringe, which was probably as necessary in his business as a lancet was in that of the surgeon.

One clyster, mentioned in the bill before us, is described as "insinuitive, preparative, and remollient, to soften the bowels of monsieur."

"What I like about Monsieur Fleurant, my apothecary," remarks Argan at this point, "is that his expressions are always so polite—the bowels of monsieur—thirty sous. Yes, but, Monsieur Fleurant, it is not the only thing to be polite, it is necessary also to be reasonable, and not to fleece your patients." So the old man notes down ten sous on the margin of the account instead of the thirty which the apothecary had charged.

Another clyster, which is described as "detersive," was composed of rhubarb, honey, and catholicon, which latter ingredient, as its name signifies, was a universal medicine supposed to have the virtue of purging the body of all ill-humours. This clyster was prepared with the intention of "sweeping, washing, and cleansing the lower stomach of monsieur—thirty sous."

Again ten sous were dotted down on the margin of the bill. It is to be hoped that the apothecary was reasonable and accepted the smaller figure.

One item was a soporific julep, "composed to make monsieur sleep—thirty-five sous."

"I will not complain of that," says Argan, "for it did make me sleep well."

Another item is a mixture, which is described as "cordial and preservative," and which contained twelve grains of bezoar, which is, I believe, a concretion found in the intestines of the wild goat of Persia. This pharmaceutical delicacy was dissolved in a syrup of lemons and pomegranates, "made according to the physician's prescription."

It is almost needless to add, when one remembers the methods of treatment then in vogue, that purgative draughts and mixtures find a place in this comprehensive invoice.

Argan wishes to marry his daughter to the son of a physician, the young man himself being about to receive his doctor's degree. The reason given by the old gentleman for this marriage, which his relatives, who pride themselves upon the social position of the family, look upon as a *mésalliance*, is that a son-in-law in the medical profession will naturally take an interest in his father-in-law's health, and will always be ready to give him the best advice.

Thomas Diafoirus, the proposed son-in-law, is a highly educated fool. He argues by the book—the dry and lifeless book of the

Schoolman's logic. What he knows he has learned by rote, and he is incapable of the least originality. He even learns by heart the pompous speeches which he makes to his lady-love and the principal members of her family, and if he is interrupted in a period, he makes a mess of the whole thing, or has to go back to the beginning.

Naturally, such a genius is opposed to all fresh discoveries in the realm of science. He prides himself upon having written and defended a thesis—possibly it was his thesis for the doctorate—against the recent discovery of the circulation of the blood. A copy of this learned dissertation he takes from his pocket, and presents as a suitable offering to the fair object of his affections.

Another *gaucherie* committed by this pleasing young man was to invite the young lady to come and see the dissected body of a dead woman, on which subject he proposed to argue at an approaching meeting of medical men.

There is a mournful interest attached to *Le Malade Imaginaire*, the last and the finest of Molière's comedies, and the pathos, like so much that is sad in this life, is tinged with irony. When the drama was first put upon the stage, the author played the title rôle—he, a dying man, played the part of one, who in the full enjoyment of health fancies he is the victim of disease.

For six months or more Molière's health had been going from bad to worse. On the day of the third representation of the new play he found himself tormented more than ever by the symptoms of his malady, and his friends begged him, with tears, not to go on the stage, but to allow an understudy to take his place. He was, however, deaf to all entreaties, and played his part to the end in spite of intense suffering. In the last scene he was seized with a convulsion, but, recovering himself with an effort, he concealed what had happened with a forced laugh. When the play was finished his friends found that his hands were icy cold. He was taken home in a sedan chair. He was put to bed, and then it was discovered that he was spitting blood profusely. The hæmorrhage increased every moment, and two hours later the great comedian died, literally drowned in his own blood.

While he was writing the story of the imaginary invalid, and still more while he was acting the part, was he not terribly conscious of his own real illness? Must not such a man have been keenly alive to the irony of the whole thing?

There is bitter raillery in his pictures of the ignorant and



E. W. SCOTT CARMICHAEL.

complacent practitioners of medicine, who, in spite of their boasted skill, were incapable of saving his life.

Can there be anything more touching than the words which the dying man puts into the mouth of the shepherdess who sings the prologue to his last play?

Votre plus haut savoir n'est que pure chimère,
Vains et peu sages médecins ;
Vous ne pouvez guérir, par vos grands mots latins,
La douleur qui me désespère :
Votre plus haut savoir n'est que pure chimère.

OBITUARY.

E. W. SCOTT CARMICHAEL.

As the solemn strains of "Peace, perfect Peace" floated through Holy Trinity Church on 15th June 1915, around the bier of Teddy Carmichael no man or woman present but realised that for him death had long lost its sting

In the midst of Life we are in Death! Death, cruel and devilish, stalks the world to-day; our fellow-citizens, friends, relations are facing violent deaths in many parts of the world, are fearlessly upholding the name and fame of the Old Country, are doing heroic deeds and dying heroic deaths. Young men fall in the flower of their youth, middle-aged men are cut off in their prime, and everywhere is the shadow of Death.

Even at such a time the death of Carmichael arrests attention. A comparatively young man, strong until recently, happily married, and with a young family, with many friends, much ability, and a numerous and rapidly increasing professional clientele, the ball of this world's happiness and success seemed at his feet.

He had fought a good fight. He was strong and progressive. Early in his career he marked out for himself a definite line of study and work, and to the principles which guided him in that choice he adhered with unswerving tenacity. Painstaking study in many medical and surgical centres in this country and abroad had convinced him that the future of gynæcology lay with the surgical expert, that the basis of surgical accuracy was thorough knowledge of anatomy and pathology, and that first-class gynæcological work could only be done by one who was not only an anatomy specialist, a first-class surgeon, and one particularly experienced in dealing with abdominal cases and cases of diseases peculiar to women, but also one who was personally engrossed in working out scientific problems in the laboratory and in the experimental room as well as in the ward and side-room.

He trained himself assiduously. Step by step he slowly mounted the ladder to fame and perfection he had set before him. The novel course he had set himself in Edinburgh was no easy one to pursue. To carry it out required rare determination and courage, complete self-confidence, and exceptional ability such as could take advantage of opportunities gained by individualistic effort. And he succeeded. Looked at from the broad, impersonal, professional point of view his life was a great success.

By his efforts the Edinburgh School of Medicine has benefited greatly. Largely owing to him gynæcology in Edinburgh has been raised to a higher plane, and though throughout the world the outlook in gynæcology had changed and was changing during the past years, yet his lifework alone has advanced this branch of surgery in Edinburgh in a manner which nothing else could have done.

To him "The School" meant everything that is best and noblest in medicine, and nothing short of ideal work was worthy of it. He devoted himself whole-heartedly to strive after his ideal, and while many of the fruits of his labours have been denied him, he yet lived to realise that he had vindicated his position, that he had not fought altogether in vain, and that had not the higher call come he could look back to the rapids of professional struggles and forward to the clear reaches of fame and success.

In the field of medical science he did much good work. His capacity for close and accurate observation is evidenced in many contributions to medical literature, and his operative skill was great. At the bedside he invariably disclosed rare judicial qualities in adjudicating the niceties of diagnosis and prognosis, and these qualities, added to the influence of a wide experience and an extensive knowledge of modern literature, made his professional opinion exceptionally reliable.

For many years he worked very hard, and during recent months, while strength was slowly ebbing from him, he continued to work hard in spite of constant suffering and distress.

His professional life stamped him as a bold man, his conduct during the past year showed him a very brave man.

Among his contemporaries no one was more popular. His ingenuous smile and cheerful attractive manner endeared him to everyone in ordinary social intercourse.

He was essentially virile. He loved life, he was determined to take all he could out of life, he subordinated all minor considerations to the basal elements in life, and consequently everything mean or petty was utterly alien to his character.

He leaves behind him a clean record. His lovable personality will long be missed, and for many and many a day his mental picture will at times arise before us and we will look back with a sigh to those days when he was with us.

A. D. F.

RECENT ADVANCES IN MEDICAL SCIENCE.

MEDICINE.

UNDER THE CHARGE OF

W. T. RITCHIE, M.D., EDWIN MATTHEW, M.D., J. D. COMRIE,
M.D., AND A. GOODALL, M.D.

THE EARLY DIAGNOSIS OF GASTRIC CARCINOMA.

GEORGE and Gerber (*Canadian Med. Assoc. Journ.*, March 1915) maintain that the old criteria upon which the diagnosis of cancer of the stomach was based, namely, twenty-four-hour food stasis, blood, and a palpable tumour, are quite worthless as far as the effective application of surgery is concerned. The cancer here is practically inoperable, or, at best, operation may stay the progress of the disease for a time. Even with the recognition of micro-retention, decrease in acidity, presence of lactic acid and Boas-Oppler bacilli, and occult blood in the stools, the clinical diagnosis is perhaps early but the cancer is not. By the time it is recognisable by these methods it is already late, and the question of radical cure is very doubtful. The more refined chemical tests and serum tests do not give reliable results. By means of X-rays, however, evidence may be obtained which pushes the limits of diagnosis much further than can be done by any other methods of examination.

The X-ray diagnosis of gastric carcinoma is of two sorts. First, there is the early recognition of what may be called advanced or latent carcinoma. These cases show rather extensive filling defects in the bismuth mass, with characteristic gross irregularities. Such cases are often missed otherwise, because they may not cause obstruction. Indeed, they may cause hypermotility. This sort of diagnosis, while interesting and definite, does not help very much, since this type of case is not early enough to give hope of a radical cure.

The second kind of X-ray diagnosis is what may be called the early diagnosis of early carcinoma. This diagnosis gives hopes of radical cure by the surgeon. The type of lesion gives rise to very few and obscure gastric symptoms. There is usually no obstruction. The acidity may be unchanged. There is no lactic acid and no blood in the gastric contents or stools. The lesions are small and are usually pyloric or pre-pyloric. The extension of growth is usually along the lesser curvature. X-ray examination in these cases is very important. The fluoroscope should not be depended upon entirely. The lesion is so small that it is easily overlooked on the screen. The indirect manifestations seen on screen study, such as hypermotility, lack of peristalsis, anti-peristalsis, etc., while important, do not warrant any

positive diagnosis, and may lead to error. In other words, the only cases which can be definitely diagnosed by the screen are fairly advanced. The diagnosis of early cases by the screen is inferential and dangerous. The chief danger is in missing lesions which could be detected by other methods of Röntgen-ray examination.

The only safe method is the direct demonstration of the lesions upon plates. The lesion consists of a defect of filling, usually very slight in size, at or before the pylorus. This defect is usually annular in character, often resembling a great elongation of the pyloric gap. The annular quality distinguishes these lesions from the ordinary chronic ulcer in this region. Just why these lesions cause this annular defect is not known.

It is possible that extension of the cancer cells into the deeper layers of the stomach wall affects its contractility, and thus exaggerates the defect. This characteristic defect should be visible on a number of plates—not necessarily a large number. It is especially important to show the defect on the lateral view of the stomach, as this disposes of the problem of pressure. The problem of the malignant degeneration of old ulcer is always present, but when this irregular annular defect is present radical surgery should be urged. This means resection if it is surgically possible, and not a mere palliative gastro-enterostomy. In the absence of adhesions, liver metastases, etc., it is often the surgeon's opinion that the case is one of chronic ulcer, and he believes that the possibility of cancer is less than the added risk of resection. With those lesions, however, which give definite X-ray signs of probable or possible malignancy, the surgeon is not justified in denying his patient the prospect of cure held out by resection.

THE BOAS-OPPLER BACILLUS AND THE DIAGNOSTIC IMPORTANCE OF ITS PRESENCE IN THE GASTRIC CONTENTS.

In the same journal Chambers discusses the significance of the Boas-Oppler bacillus. These organisms are rod-shaped, varying from 3 to 15 μ in length and 1 μ in thickness. They stain with methylene blue and with Gram. In more than 70 per cent. of cases in which these organisms are found in the gastric contents cancer is present. If a fair number of bacilli, therefore, are found, and if the sign is accompanied by other symptoms of gastric cancer, an indication for surgical intervention exists, provided the case is not too advanced to be inoperable. It occasionally happens that in cases where the bacillus has been present, operation fails to reveal cancer. Such exceptions to the general rule do not affect the principle, since risks cannot be afforded in dealing with cancer of the stomach. Moreover, even if a malignant growth is not present, the surgeon generally finds a benign condition which requires surgical treatment.

There are many cases of cancer of the stomach in which the bacilli are never present. They are present, however, in the great majority of cases with absence of free HCl, and in a considerable proportion of cases with a small amount of HCl. This secretory change alone does not account for its presence. Pyloric obstruction is an important factor, favouring the growth of the bacilli as well as sarcine and other micro-organisms; but if the obstruction is accompanied by hyper-chlorhydria, sarcine are common but Boas-Oppler bacilli are rare.

In cases with no disturbance of motor function the factor which may determine the presence of bacilli is the degeneration which is so common in malignant disease. The necrotic and ulcerative processes tend to form a nidus, if not a pabulum, for the growth of germs in the absence of the stagnation of food. That this is the case is supported by the fact that almost a pure culture of the Boas-Oppler bacillus may be found in particles of necrotic tissue obtained by gastric lavage before breakfast in some cases of malignant ulceration of the stomach.

VACCINES IN THE TREATMENT OF BACTERIAL DISEASES OF THE LUNGS COMPLICATING PULMONARY TUBERCULOSIS.

Wittich (*Canadian Med. Assoc. Journ.*, April 1915) states that while the pathogenic bacteria of the respiratory tract are usually referred to as producing "secondary infections" to tuberculosis, it has been suggested that they may be frequently the primary invaders predisposing lung tissue to implantation with tubercle bacilli. They are the predominating infection in certain cases of pulmonary tuberculosis, and may produce toxic symptoms to a large extent. This may account for the rapid subsidence of physical signs in a certain number of cases. An autogenous vaccine may diminish the effects of the secondary organisms, and may lessen the predisposition to spread of tuberculosis and the activity of growth of the tubercle bacilli.

To obtain the vaccine the mouth should be rinsed out with dilute hydrogen peroxide, the teeth cleaned, and then the mouth washed out with sterilised water. The sputum is expectorated into a sterilised bottle. It is shaken in an Ehrlenmeyer flask in distilled water till several pieces the size of a pea are separated. These are used to inoculate agar and blood-agar tubes. The vaccines are standardised, and the doses as given in *The Extra Pharmacopœia* may be employed. Tuberculin may be given at the same time. The predominating bacterial flora of the respiratory tract seems to vary in different localities.

In streptococcal cases the clinical manifestations are usually the most severe, and the asthmatic element most in evidence. No arbitrary rules can govern dosage or intervals of vaccine administration. Frequent chest and sputum examinations should be made during the treatment. A local reaction characterised by hyperæmia

at the site of injection, with tenderness and swelling, and without constitutional symptoms, indicates a decrease or continuance of the same dose. If accompanied by headache, malaise, anorexia, slight rise in temperature or pulse, the inoculation is omitted once and subsequent dosage is reduced.

INTESTINAL TUBERCULOSIS, WITH SPECIAL CONSIDERATION OF THE HYPERPLASTIC FORM.

An interesting case of hyperplastic intestinal tuberculosis is reported by Randt (*Long Island Med. Journ.*, April 1915), who discusses the condition.

Primary intestinal tuberculosis is common in infants and young children on account of slight powers of resistance and their daily exposure to the milk of tuberculous cows. In older children and adults primary infection is rare. Secondary involvement of the intestine, on the other hand, is common. The primary focus is almost invariably a tuberculous lung, the carrier of the infection having swallowed sputum. Occasionally the bacilli reach the intestine, not in the sputum but by hæmatogenous or lymphogenous channels. Whatever lowers the vitality of the intestine becomes a predisposing factor. Catarrh and erosions are therefore important in this respect. The initial lesion in intestinal tuberculosis occurs almost invariably in the lower ileum and in the cæcum. The point of invasion is the Peyer's patches and the solitary follicles. The proliferation of cells which follows induces swelling of the follicle with subsequent caseation of its centre. This may eventually form an ulcer, which may fuse with others, and following the circular course of the lymphatics the ulcers may creep transversely round the bowel.

The symptoms of ulcerative intestinal tuberculosis are practically those of an enteritis from any other cause.

In another variety of intestinal tuberculosis the bacillus, instead of causing necrosis and caseation, produces an enormous hypertrophy, resulting in tumour-like growths, usually limited entirely to the cæcum. These masses are so well defined and so similar to malignant growth that even after excision a naked-eye examination may not help to clear up the diagnosis.

This may perhaps explain the good results which have sometimes followed excision of a presumed carcinoma or sarcoma. Indeed, the enormous small-cell proliferation may suggest sarcoma on examination with the microscope.

The cæcum is not the only site of hyperplastic tuberculosis. Similar tumours have been found in the larynx, peritoneum, pleura, joints, nose, muscles, heart and lymph glands. In the latter the condition may be mistaken for Hodgkin's disease.

Hyperplastic intestinal tuberculosis affects persons in the middle

period of life. It has been suggested that the hyperplasia is due to irritation by bacilli of low virulence which do not generate enough toxin to cause necrosis and caseation. One fact stands out clearly in almost every reported case, that is the comparative insignificance of the co-existing pulmonary infection, or even its total absence. The symptoms are therefore indefinite and diagnosis very difficult. The patient may complain of vague gastro-intestinal symptoms for years until a lump is found. Colic and ballooning of the ileum may then occur.

The treatment of ulcerative tuberculosis is medical. Creosote, on account of its incidental effect on the lungs, is a particularly useful intestinal antiseptic in these cases. Tuberculin does not do much good. Paraffin may be useful in soothing and coating the mucosa.

In the hyperplastic type the indications for surgery are very strong. The palliative method excludes and puts to rest the diseased portion of bowel. The radical method by excision of the disease should be practised when possible. A number of permanent cures are on record.

A. G.

SURGERY.

UNDER THE CHARGE OF

J. W. STRUTHERS, F.R.C.S., AND D. P. D. WILKIE, F.R.C.S.

THE OSTEOGENIC POWER OF PERIOSTEUM.

IN the *Bulletin of the Johns Hopkins Hospital* of March 1915, J. S. Davis and J. A. Hummcutt record a series of experiments which corroborate and amplify the researches of Macewen on the growth of bone.

One hundred and sixty-seven experiments were made on dogs and rabbits, and as far as possible young animals were selected. The results were controlled by dissection and by X-ray and microscopic examination. The experiments are arranged in eleven groups, the last of which contains miscellaneous experiments.

In *Group I.* portions of free periosteum were transplanted into muscle and subcutaneous tissue. In the first series the free periosteum was devoid of particles of bone, but was proved by microscopic examination to possess the greater part of the underlying osteoblasts. After variable intervals of time the portions of transplanted periosteum were examined, but in no instance could any growth of bone be detected. A similar series of experiments was performed, the portions of periosteum having been removed along with a thin shaving of bone. In every case there was definite bone formation.

In *Group II.* a modified procedure was adopted. Pedunculated flaps of periosteum were raised and planted into or around adjacent muscles. When the flaps were raised free from bone particles no new

bone formation could be demonstrated. In every case, however, in which a flap of periosteum with a thin film of bone attached was transplanted the flap lived and from it new bone formed. The intermediate cartilage stage was noted in femur flaps, but not in rib flaps.

From the above it was concluded that periosteal transplants alone are incapable of forming bone, and that for the production of bone the periosteal transplants must be accompanied by particles of bone.

Group III. deals with subperiosteal resection of bone, the periosteal tube, as far as possible, being left undisturbed. In one series the periosteal tube was closed, and the size and appearance of the regenerated bone were nearly normal. In the other series the tube was left unclosed and the size and contour of the regenerated bone were irregular. The new bone was shown by X-ray to be formed from the old bone stumps. In one experiment, in which the free ends of ribs were covered by metal caps, no new bone was found after 28 days. In another experiment the entire radius with its articular cartilages was removed, and after 129 days there was no bone formation. The experiments of this group, according to the observers, indicate that the periosteum acts merely as a limiting membrane.

The experiments of *Group IV.* were made to investigate the changes that occur when portions of bone and other substances are transplanted into the periosteal tube after partial subperiosteal resection of a rib. Portions of bone, some covered with periosteum and others stripped of periosteum, and various bodies, *e.g.* silver wire and rolls of insoluble gelatine, were implanted into the periosteal tube. The results obtained were such as to lead to the following conclusions:—Bone stripped of periosteum when transplanted into a periosteal tube will cause a very marked stimulation of bone growth, both from the rib ends and from the periosteum, in a comparatively short period of time. On the other hand, transplants covered with periosteum and also foreign bodies seem to have no effect on the periosteum, but in each instance there is stimulation of growth from the rib ends.

Group V. consists of experiments with silver wire. It was found that when silver wire is placed around a bone subperiosteally, there is little, if any, new bone formation from the periosteum or bone. The authors believe that in those experiments reported by others in which the ring was completely buried in new bone, either there was infection or that the surface of the bone was much traumatised after or during the removal of the periosteum.

Group VI. deals with the implantation of bone into prepared defects in the skull. The defect was made in the temporal region, and the grafts were observed by means of the X-ray and examined microscopically. There was proliferation of bone, both from the edges of the defect and from the fragments. This was especially noticeable in the small fragments, as there was comparatively a much larger raw surface

and consequently a better blood-supply. The new bone seemed to come from the cut surfaces rather than from the surface from which the periosteum was stripped.

In *Groups VII.* and *VIII.* the effect of transplanting bone into soft parts was investigated. The results were admittedly not very conclusive. Transplants both from the same animals and other animals in the large majority of cases would, in the opinion of the observers, be absorbed. Those covered with periosteum were more likely to persist longer than those stripped of periosteum. There was evidence that bone from the same animal was capable, under certain circumstances, of forming new bone, but this could not be said of bone from another animal.

In *Groups IX.* and *X.* experiments are described in which transplants were placed in defects made by resection of segments of bone with the overlying periosteum. In some cases the transplant was taken with periosteum and in other cases without periosteum. Further, some transplants were obtained from the same animal and in other cases from another animal of the same species. These experiments showed that a transplant from the same animal lives and becomes a part of the host. Moreover, the transplant tends to assume the size of the bone into which it is transplanted. If small fragments be placed in a defect, strips of fascia may be utilised to substitute the periosteum as a limiting membrane, and the fragments will heal smoothly into place.

Transplants from other animals, however, were found to stimulate the growth of bone from the bone stumps, and act as a kind of scaffold to the growth of new bone, but finally there was absorption of the transplant.

In an article entitled "Periosteal Regeneration of Bone" (*Journ. of Surg., Gynec., and Obstet.*, May 1915) T. D. Smith arrives at conclusions very different from those stated above. After a brief survey of the history of the theory of bone regeneration, he gives an account of the development and histology of the periosteum. He believes that the conflicting results published by different observers depend upon the variability of the periosteum used. From experimental evidence he is led to believe that it is possible to vary the end results according to certain technique. He maintains that a greater percentage of positive results will be obtained with periosteum which is stripped slowly and with an elevating action of the periosteotome than when the periosteum is quickly torn loose from the compact bone. He holds that a very large percentage of positive results can be obtained by using very young animals and small strips of periosteum.

EMPYEMA OF THE THORAX.

A. O. Wensky (*Journ. of Surg., Gynec., and Obstet.*, May 1915)

makes a critical study of 299 cases of acute empyema of the thorax treated at Mount Sinai Hospital, New York.

The incidence of empyema in that hospital amounted to $\frac{1}{2}$ per cent. of the combined medical and surgical patients.

Etiology.—The disease was most common in the first two years of life, more than one-third of the cases occurring in that period. Approximately two-thirds of the cases were males. Eighty-three per cent. occurred as a complication of some previous affection of the lungs or pleura, and 66 per cent. of all the cases followed either a lobar or broncho-pneumonia.

In 11 per cent. of the patients the empyema occurred as a primary disease. In 2 or 3 per cent. the empyema developed as a secondary focus to some lesion in a distant part of the body, *e.g.* infection of the pharynx and tonsils, appendicitis, purulent inflammation of the pelvic organs, and after an acute otitis media. Some of the patients developed empyema after one of the infectious diseases, and in these cases pneumonia was almost invariably an intermediate factor.

A few cases resulted from a blow or stab wound of the chest. Tuberculous empyemata, including the group of infected pleural effusions—hydro-, pneumo-, and pyo-pneumothorax—constituted 5 per cent. of the cases. Such cases were comparatively rare, and had a high mortality. Of those with tuberculous empyema 50 per cent. died, and those that lived developed chronic sinuses most difficult to heal. Other cases resulted from spread from the peritoneum, from carcinoma of the œsophagus, and from liver abscess.

Pathology and Bacteriology.—The author agrees with Grawitz, Arnold, Netter, and others that primary empyema, although relatively rare, is more common than is usually supposed.

Bacteria are inspired and conveyed to the ultimate air alveoli, where they lie in relation to the visceral pleura or are transmitted by the lymphatic structures of the lung parenchyma, and cause reaction in the pleura alone. In these cases the exudate is purulent from the very beginning.

Some of the cases were caused by the spread of infection from a local abscess, either by the abscess bursting into the pleural cavity or by spread along the lymphatics. Most of the cases were "metapneumonic." Gerhard's distinction between metapneumonic and parapneumonic is believed to be purely academic, and, clinically, it was impossible to differentiate these varieties.

Empyemata, due to the rupture of intra-pulmonary foci of suppuration, were the most dangerous, and frequently led to the formation of broncho-pulmonary fistulae. Such foci of suppuration may be due to pyogenic or tuberculous organisms, bronchiectasis, may originate in a gangrenous process in a consolidated lung, or may follow an influenzal pneumonia. Tuberculosis of the pleura is nearly

always secondary to tuberculosis of the lungs or bronchial lymph glands. It is encountered very commonly, but in the author's experience rarely gives rise to suppuration. There were nine cases of interlobular empyema. These occurred both in children and adults. Unless fairly early drained, they have the tendency to rupture into the lung parenchyma and to discharge through a bronchus. Bronchopulmonary fistula is a common complication. Three cases of *empyema necessitatis* are mentioned, and all of them pointed in the neighbourhood of the mammary line.

The character of the effusion varied; in some it was purulent from the first, whereas in others it was serous, and very soon became purulent. The presence of clear fluid in some cases might indicate that an abscess was situated close by, either in the lung or under the diaphragm.

Two lists of bacteriological findings are given. In about 50 per cent. the pneumococcus was found, in more than 20 per cent. streptococci, and in about 10 per cent. the staphylococcus aureus occurred. Many other organisms were found. In a certain number of cases anaerobic bacteria were present, but these cases in no way differed clinically from those caused by the ordinary pyogenic organisms.

Blood-cultures were made, but organisms were not demonstrable, except under the following conditions—(1) in the presence of complications, such as arthritis or osteomyelitis; (2) as an ante-mortem invasion in fatal cases.

For diagnostic purposes, exploratory aspiration was the rule, and a list of the accidents that occurred from this procedure are recorded.

Treatment.—A few cases were treated by aspiration and irrigation methods, but with uniformly bad results, except in very young children. In the author's experience, Murphy's formalin treatment never gave satisfactory results.

Intercostal incision was only used when the patient was in a very precarious condition. Thoracotomy with rib resection was the operation of choice. Beck's recommendation to pack the entire cavity with gauze through a large opening is considered unwise. The results of various methods of suction drainage were not encouraging. Irrigation of the abscess cavity, either at the operation or later at each dressing, was believed to be somewhat dangerous. Among the many *complications* that are recorded only the most common need be mentioned.

Pneumonia occurred in 23 cases, middle ear suppuration in 14 cases, subcutaneous abscess at a distance from the empyema wound in 9 cases, bronchial fistula, pulmonary oedema, and nephritis each in 6 cases. An interesting table is that which shows the relation between the pre-operative interval and the resulting mortality. One notes the gradual decline in the mortality the longer the pus had been present

in the chest before operation. This does not imply that empyemata should not be operated upon until a late period. Such a course of treatment is conducive to the frequent formation of rigid uncollapsible cavities, to chronic sinuses, and in some to marked deformity of the chest. It is recommended, on the other hand, that operations should not be done when the pus is thin, and has been present for only 24 or 48 hours. Those cases admitted in a desperate state frequently benefited by first aspirating the major portion of the pus, and later, when the patient had recovered from the profound shock, he could then be subjected to thoracotomy.

Results.—The least unfavourable period was between 3 and 10 years of age. The mortality varied from 50 per cent. in infants to 18 per cent. in adults, and averaged 28 per cent. Four per cent. died as a result of the operative procedure, and 4 per cent. died from exhaustion caused by the empyema. The remaining 20 per cent. died as a result of some complication or intercurrent disease. J. N. J. H.

OBSTETRICS AND GYNECOLOGY.

UNDER THE CHARGE OF

A. H. F. BARBOUR, M.D., AND J. W. BALLANTYNE, M.D.

ANGIOMA OF THE PLACENTA.

THE pathology of placental neoplasms is a comparatively little-understood department of obstetrics, and yet such growths must have very important relations both with other parts of morbid anatomy and with the conditions of health and disease of mother and unborn infant. Dr. R. Malaguzzi Valeri's case of angioma of the placenta, therefore, has not only a pathological but also an obstetrical interest, and is well worthy of notice (*Ann. di ostet. e ginec.*, 31st March 1915, ann. xxxvii. vol. i p. 131). The patient was a II.-para, 24 years of age, whose menstrua and earlier obstetric history had been uneventful; her first child was alive. About the seventh month of her present pregnancy she began to suffer from strong pains in the loins, but had no bleeding. She gave birth at the full term to a living female infant, weighing 3100 grams. The placenta came away entire and the hæmorrhage was normal. A few minutes after her delivery the woman suddenly was seized with violent trembling, had a severe headache, experienced amblyopia, and showed cyanosis of the face; but these alarming symptoms and signs soon passed off. The temperature and pulse were normal throughout but the first heart sound was impure and prolonged. The puerperium was normal in every way. The placenta measured 21 by 25 cms. in its diameters, and weighed 1160 grams. The cord, which was 50 cms. long was inserted centrally. On the maternal surface of the placenta was :

shining round body of the size of an orange, showing a surface broken up into lobules by deep sulci. It had a degree of mobility, being attached to the placenta only by a vascular pedicle, and its blood-vessels came directly from the cord. When the growth was removed it was found that it had been implanted not on the placenta, but on a second neoplastic node quite isolated from it, and measuring 15 cms. long and 5 cms. broad, and having no separate vascular connections such as the first one had. Both growths had a firmer consistence than that of the placenta; both showed a reddish-brown appearance on section, a non-homogeneous surface, and a real capsule. Under the microscope the tumours exhibited a commencing necrobiosis: there was a cavernous appearance, irregular connective-tissue fibres forming a thick network with spaces lined by endothelium and containing breaking-down red corpuscles; and the vessel walls showed necrotic changes, whilst true thrombi were found in some of the vessels. There were large numbers of spaces in which blood circulated. Dr. Valeri therefore regarded the tumour as an angioma or a chorio-angioma undergoing necrobiosis.

Sometimes tumours such as that described by Valeri show features which resemble those met with in the chorio-epithelioma, and about a year ago W. H. Cary reported one (*Amer. Journ. Obstet.*, 1914, vol. lxix. p. 658) which was named a sarcoma by several authorities, but yet contained angiomatous and myxomatous tissue as well as perivascular small cells. In Cary's case the cord was inserted marginally into the placenta and measured 39 cms. in length; the placenta itself was 14 cms. in diameter, was almost circular in shape, and had on its maternal aspect a nodulated kidney-shaped tumour 7 cms. long by 4 cms. broad and 2 cms. thick. It had a glistening surface, almost as if it had been covered with peritoneum. A second somewhat similar growth had been attached to the placental substance near the first, but had become detached. Both growths had a liver-like appearance on section. Under the microscope the picture was that of a chorio-angioma; there were large numbers of blood spaces of varying size, lined by a single layer of endothelium, which were separated from one another by varying amounts of almost mucoid connective tissue very poor in nuclei. In other parts, however, there were areas of proliferated round and oval cells, separated by connective tissue or closely packed together and completely replacing the original stroma. Dr. Cary's patient was a primipara, 19 years of age; her pregnancy had been complicated by retroversion of the uterus, and had ended two weeks before the expected date. The labour was easy; the baby weighed 6 lbs. 3 ozs., and there was no abnormal blood loss.

Reports such as these made by Valeri and Cary demonstrate the obscurity which surrounds the histology of placental neoplasms; indeed a careful scrutiny of the literature of the subject leaves it

still doubtful whether any true instances of sarcoma of the afterbirth have yet been put on record. All tumours of the placenta are rare, a fact which must have a meaning in the etiology of new growths; and it is interesting to note that the first one to be reported (by John Clark in 1798) was called an angioma. Since then about seventy-nine in all have been put on record, including myxoma-fibrosum, fibroma, angioma, and so-called sarcoma. There is certainly much need for investigations in this field of pathology, and inquiry ought always to keep in view the exceptional nature of the placental structure in which maternal and foetal elements meet and come into vital relations in a manner which is unique in the human body.

LABOUR IN THE PELVIS DEFORMED BY CONGENITAL DISLOCATION OF THE HIP.

Péry and Balard (*Arch. mens. d'obstét. et de gynec.*, February 1915, ann. iv. p. 49) have recently met with two cases of labour in patients with the pelvis deformed by congenital dislocation of the hip, and have been led to ask whether the general statement found in obstetrical works, viz. that such a pelvis is not usually a cause of difficult labour, is correct. They refer to Delmas' recently-arrived-at conclusion that the pelvis with double dislocation of the hip is not, apart from its anteversion, a dystocie pelvis, for the only narrowing which is constantly met with in it affects the false or upper pelvis. The brim, cavity, and outlet of the true pelvis all show a tendency to increased measurements, and this increase is due to the swinging outwards of the ischia, which is caused by the approximation of the iliac crests under the influence of the compression exercised by the femoral heads acting above their usual level. So, too, in cases of unilateral dislocation the results are the same, but acting on one side only cause an asymmetry, but do not ordinarily interfere with the labour. Sometimes, however, on account of the accompanying atrophy the asymmetry is rendered more marked and the foetal head finds a difficulty in engaging. Péry and Balard are of opinion that this atrophy is always more marked in cases of single than of double dislocation, and from a study of the two cases which they report they maintain that the dislocation by itself has no effect, but that the atrophy is all-important in arriving at a prognosis.

The first case was that of a primipara, 24 years of age, a cripple from double congenital dislocation of the hip. She was sent into hospital by her medical attendant, who feared a difficult labour. She had not walked till the age of three years; her menstrual history was normal. She was not quite certain as to the age of her pregnancy, but thought she was at the eighth month. She showed a very marked lumbar deformity, due in part to the exaggerated pelvic anteversion, in part to the compensatory lumbar lordosis, but also to the flattening of the vertebral bodies, for the false ribs nearly touched the iliac crests.

There was no lateral deformity of the pelvis, but the buttocks were very prominent, and the diamond-shaped space of Michaelis was greatly deformed. The vulvar aperture looked directly backward. The epitrochanteric line of Budin and Richer was quite horizontal, and passed at a distance of 3 cms. above the fold of the groin. There was marked shortening of the lower limbs due to the great displacement upwards of the femoral heads. The foetal head was found on vaginal examination to be lying above the brim of the pelvis and to be resting upon the symphysis pubis; but it could easily be pushed backwards into the false pelvis, and made to engage in the cavity of the true pelvis. Pelvimetry revealed that the pelvis was only slightly narrowed in the transverse diameters, whilst at the outlet its measurements, especially the transverse, were increased. Radiography showed a nearly circular brim of the infantile type and almost complete symmetry. Labour occurred without any trouble, and the second stage lasted only one hour; the only abnormality was a perineal tear due to the rapid descent of the head. The child was of normal size, and the puerperium was uneventful.

The other case had a different history. She was a primipara of 21 years, and was brought into hospital because of lameness of the left leg, along with marked atrophy of the limb and nearly complete ankylosis of the hip. She had only begun to walk at her second year, but had been healthy in other respects. She was seven and a half months pregnant when brought into hospital. The most striking feature was the atrophy and shortening of the left leg, the left foot touching the ground only with the toes; the left buttock was atrophied, and the fold of the groin was raised. Michaelis' lozenge-shaped space was quite symmetrical, and the pelvis was inclined downwards and to the right. The movements of the limb were much reduced, and there was no power of abduction or adduction at all. The foetal head was found lying above the brim, but capable of being pushed into the pelvic cavity. From the external pelvimetry it was at first thought that the internal diameters were little affected, but the vaginal examination and radiography did not confirm this hopeful opinion, for whilst the promontory of the sacrum could not be felt, the left innominate line was more easily reached. The X-rays revealed a brim which was distinctly asymmetrical; the left innominate bone was markedly atrophied: the sacrum was tilted towards the left, and (a somewhat unusual condition) it looked towards the affected side. A few weeks later, when the patient was $8\frac{1}{2}$ months pregnant, it was found that the foetal head could not easily be made to engage in the pelvic brim, and on this account premature labour was induced by the introduction of a bougie, and later of the Champetier de Ribes' bag, followed by the injection of pituitrine and the use of forceps. The infant was under weight, but both mother and child made good recoveries.

The authors think that these cases show that the grave anteversion of the uterus due to the marked inclination of the pelvis does not greatly interfere with the engagement of the head when labour comes on, but may seriously complicate the introduction and employment of the forceps if it should be needed, even to the causing of the risk of uterine rupture. However that may be, delivery in the pelvis affected with bilateral congenital dislocation of the hip is not usually made difficult by reason of non-engagement of the foetal head; indeed, the expulsion of the infant is not uncommonly precipitate, and laceration of the perineum is a frequent complication. On the other hand, when only one hip-joint is affected and when the corresponding limb is markedly atrophied, the pelvis may be so altered as to make the induction of premature labour necessary. Further, this anomaly can be foreseen by external pelvimetry, for in unilateral dislocation of the hip, with one-sided atrophy, the external measurements of the false pelvis may all be larger than in the pelvis with bilateral dislocation, and yet the bischial may be much less. The general conclusion, therefore, follows that in such cases it is neither the lameness nor the dislocation that is to be feared, but the atrophy; upon the degree of atrophy depends the nature of the prognosis formed. The value of pelvimetry during pregnancy in cases of congenital dislocation of the hip is never to be underestimated; it may guide the obstetrician to a correct decision regarding the need for the induction of premature labour, and so may save an infantile life and protect the mother from suffering and injury.

J. W. B.

DISEASES OF THE EAR.

UNDER THE CHARGE OF

A. LOGAN TURNER, M.D., F.R.C.S.E., F.R.S.E., J. S. FRASER, M.B.,
F.R.C.S.E., AND W. G. PORTER, M.B., B.Sc., F.R.C.S.E.

TUBERCULOSIS OF THE EAR.

(The following review of the subject of aural tuberculosis is taken, for the most part, from a paper written by two of the abstractors [A. L. T. and J. S. F.]. This paper formed the subject of a communication to the otological section of the Royal Society of Medicine in February 1915, and appeared in full in the *Journal of Laryngology* in June 1915.)

A. THE EXTERNAL EAR.

Tuberculosis of the external ear occurs in four forms—(1) *Lupus* of the auricle in cases of lupus affecting the head and neck. (2) *Tuberculosis of the lobule*. This is an inoculation tuberculosis, and is almost invariably due to the piercing of the lobule for the insertion of ear-rings. The lobule becomes swollen and the skin covering it is shiny

and bluish. The growth is slow and is not associated with pain. The glands are seldom affected. The diseased area, which has the consistence of a soft fibroma, is sharply marked off from the surrounding normal tissue. Microscopic examination shows that the condition is one of epithelioid tuberculosis with considerable formation of fibrous tissue. There are few giant cells and tubercle bacilli. Treatment consists, as a rule, in removal of the diseased area by means of the knife, but Torretta (*Centralbl. f. Ohrenheilk.*, 1913) recommends galvano-caustic puncture. The condition is liable to recur. (3) *Tubercular perichondritis* of the auricle is described by Heschl (*Centralbl. f. Ohrenheilk.*, 1910). (4) *Tubercular ulceration of the external auditory meatus* is of rare occurrence, but is sometimes met with in cases of tubercular otitis media; it usually affects the posterior wall of the canal.

B. THE MIDDLE EAR, LABYRINTH, AND INTRACRANIAL STRUCTURES.

Ostmann (*Münch. med. Wochenschr.*, 1902, No. 29) has found that children from tubercular families showed twice as many cases of deafness as children from healthy families. The tubercular diathesis produces increased vulnerability of the nasal and pharyngeal mucous membranes.

1. *Classification and Etiology.*—Cases of tubercular otitis media may be divided into two groups—(a) *Infants and very young children* who are fed, in whole or in part, on unsterilised cows' milk which contains the bovine type of tubercle bacillus. This view of the etiology of tubercular otitis media is supported by the frequency of tubercular otitis media in infants and young children as compared with the ordinary purulent forms. If we take otitis media at all ages, we find that tuberculosis only accounts for 2·8 per cent. of the cases; but if we consider only cases of otitis media under 2 years of age, we find that tubercular middle ear disease accounts for 27 per cent. of the cases, and that, under 1 year, half the cases (50 per cent.) are due to tuberculosis. The work of John Fraser on tubercle of bone and of Philp Mitchell on tuberculosis of glands and on tubercular infection of the Edinburgh milk supply strongly supports this view of the etiology of tubercular otitis media in infants. Weichselbaum (*Wun. klin. Wochenschr.*, 1907, No. 38) has shown that ingestion tuberculosis may spread not only from the intestines but also from the pharynx. In the affected mucosa and also in the regionary lymph glands one does not always find specific or manifest tubercular lesions. (b) *In the advanced stages of phthisis pulmonalis* we meet with tubercular disease of the middle ear cleft. Statistics as to the frequency of tubercular otitis media in consumptives vary very greatly. St. Clair Thomson only found two cases of tubercular otitis among seven hundred patients

suffering from pulmonary tuberculosis (tubercle bacilli present in the sputum in all of these 700 cases). Herzog, on the other hand, found chronic purulent otitis media in seventeen out of a hundred cases of consumption; five of these seventeen cases showed labyrinthine involvement. De Rossi (*Centrbl. f. Ohrenheilk.*, 1910, p. 46) found 26 cases of otitis media among 280 cases of phthisis pulmonalis. Turner and Fraser have examined five cases of chronic purulent otitis media occurring among a hundred and twenty cases of pulmonary phthisis—mostly in the advanced stages—at the Edinburgh Fever Hospital. In only one of these five cases was there any suspicion of tubercular otitis media.

2. The *route of infection* in tubercular otitis media is still a matter of dispute. Haike (*ibid.*, 1905, p. 294) suggests that in some cases of tubercular ear disease in very young infants the possibility of inherited tuberculosis must be considered. It is generally agreed, however, that there are two possible routes—(a) by way of the Eustachian tube, and (b) by the blood-stream. (a) Infection *viâ* the tube may be produced—(1) by tubercular infiltration of the mucous membrane spreading up the tube to the tympanic cavity; ulceration of the surface is usually present. This mode of infection is probably the usual one in infants, and is frequently associated with tuberculosis of the mucosa of the nasopharynx, including the adenoid post-nasal growths; or (2) by insufflation of infectious particles up the Eustachian tube during the acts of coughing, sneezing, or vomiting. This, (2), is the usual route and mode of infection in advanced cases of phthisis pulmonalis, and may be predisposed to in consumptives by the absorption of the fatty tissue in the walls of the Eustachian tube, rendering the tubes more patent than normal. Infection of the middle ear cleft by the insufflation of infective particles is also quite probable in infants fed on unsterilised cows' milk, as the Eustachian tubes at this age are wide and straight, and vomiting is of frequent occurrence. Microscopic investigation of the Eustachian tubes in infants and young children dying of abdominal tuberculosis, or of children and adults dying of phthisis pulmonalis, would be of great value in settling the dispute as to the mode of infection. Further, the microscopic examination of adenoid post-nasal growths removed from infants and young children who have been fed on unsterilised cows' milk would be of great interest.

(b) The other possible route of infection is by way of the *blood-stream*—the hæmatogenous route. It is not easy to be sure that the middle ear has been infected by this route, but if the Eustachian tube and tympanum appear to be healthy, while the mastoid process alone is diseased, the probability is that the infection has occurred by way of the blood-stream. Definite proof can only be obtained by post-mortem investigation. Henrici (*Zeitschr. f. Ohrenheilk.*, Bd. xlviii.) thinks

that most cases of tuberculosis of the ear are due to blood infection, and that the lesion starts in the bone of the mastoid process. Panse (*Centrbl. f. Ohrenheilk.*, 1913) records a case of pure hamatogenous infection. Even Brieger, who is a strong supporter of the tubal route of infection in the majority of cases, admits that the hamatogenous form of infection does sometimes occur.

3. *Types or Stages of Tubercular Otitis Media.*—Brieger (*Centrbl. f. Ohrenheilk.*, Bd. xi. S. 273) describes four types of tubercular disease of the middle ear. He admits that it is probable that these types may only be stages in the disease process. (a) A *lupoid* type, in cases of lupus of the nose and throat. The disease spreads up the Eustachian tube to the tympanic cavity, and gives rise to a slow and mild form of otitis media. (b) An infiltrating form, which progresses rapidly, and shows numerous tubercle bacilli but few giant cells. (c) A fungating or more chronic form, with well-developed tubercle follicles and only a few bacilli. The mucosa is greatly thickened and may form polypi. There is a distinct tendency towards encapsulation of the tubercle follicles and spontaneous cure of the condition. (d) A necrotic form, which tends to rapid caseation and destruction of the mucosa, and also of the bony capsule of the labyrinth. The exact cause of the necrosis is not certain. It may be due to blockage of one or more of the arterial branches supplying the labyrinth capsule, but a more probable explanation is that mixed infection is present in these cases. (e) Herzog describes a fibrinoid form of tubercular otitis media in which a false membrane forms on the tympanic mucosa. (f) In the paper under review, photomicrographs are shown of a fibro-ossifying type of tubercular otitis interna. In this case Nature has made considerable effort towards a spontaneous cure of tubercular labyrinthitis by the formation of new fibrous tissue and new bone. This type of tubercular bone disease is well recognised in the case of the long bones.

It is not certain what factors determine the type of tubercular otitis present in a given case, but the following considerations are probably of importance:—(1) Type of bacillus present; (2) the resisting powers of the patient; (3) mode of infection (tubal or hamatogenous); (4) presence or absence of mixed infection.

4. *The Clinical Characteristics of Tubercular Otitis.*—(a) The age incidence, and (b) the question of feeding, have already been dealt with. (c) The onset of tubercular otitis appears to be painless in 92 per cent. of the cases; this is in marked contrast to the early stages of simple purulent otitis media. (d) The lymph glands surrounding the ear are enlarged in 95 per cent. of the cases. (e) In the early stage of tubercular otitis the discharge is watery and later may be flocculent; in the advanced stages, where mixed infection is present, it is offensive and purulent. (f) More or less marked paralysis of the facial nerve was present in 45 per cent. of the cases recorded by

Turner. The protection which the facial nerve enjoys in ordinary cases of suppurative otitis media on account of its special blood-supply does not hold good against tubercular invasion. (g) Multiple perforations in the tympanic membrane may often be seen in adults in cases of tubercular otitis associated with phthisis pulmonalis. In infants, however, the sagging of the posterior superior meatal wall usually prevents inspection of the drumhead. (h) If mixed infection occur in a case of tubercular otitis, the symptoms of an acute otitis media and mastoiditis may arise and may confuse the diagnosis.

5. *Tubercular Labyrinthitis*.—The involvement of the labyrinth in cases of tubercular otitis media is of frequent occurrence, and takes place at a comparatively early stage of the disease (see Case I. in paper under review). The percentage of cases of labyrinthitis varies from 23 (Kuemmel) to 33 per cent. (Siebenmann). Turner's statistics show that labyrinth necrosis was present in 22 per cent. of the cases operated on, while in another 31 per cent. there was erosion of the labyrinth wall, thus giving a total of 53 per cent. In infants and very young children the ordinary tests of the labyrinth function can hardly be applied (tuning-fork tests, rotation, etc.), but after the radical mastoid operation has been completed the inner wall of the middle ear may be tested by the application of cold lotion, which, if the vestibular apparatus be functional, produces a conjugate deviation of the eyes to the lower or non-operated side; if the vestibular apparatus be destroyed by disease no such deviation occurs.

Tubercular infection spreads to the labyrinth from the middle ear as a rule by way of the oval or round windows. The stapes footplate is soon eroded, but the endosteum of the labyrinth resists and is pushed inwards in front of the mass of tubercular granulation tissue for some distance before rupture occurs and the perilymph space of the vestibule is definitely invaded. Infection of the labyrinth through the secondary tympanic membrane, closing the round window, may occur later than invasion through the oval window, but when it does begin it is not resisted to the same extent. Induced labyrinthitis is sometimes found in this region, *i.e.* involvement of the scala tympani of the basal coil without any actual perforation of the round window membrane. The prominence of the external semicircular canal is sometimes the seat of a fistula into the labyrinth, but not so often as in cases of chronic purulent otitis media and cholesteatoma. On the other hand the promontory is much more often diseased in tubercular than in simple purulent otitis.

It is possible for infection of the cranial subarachnoid space to occur by way of the aqueduct of the cochlea in such cases, but the authorities appear to believe that tubercular labyrinthitis is rarely or never the cause of a tubercular intracranial affection. Tubercular labyrinthitis shows little tendency to spontaneous cure, though microscopic

sections of such a condition are shown by the abstractor in the paper from which this abstract is made. Clinically, tubercular labyrinthitis—like tubercular otitis media—appears to have a quiet onset. This is in marked contrast to the violent symptoms produced by an attack of acute purulent “manifest” labyrinthitis, due to the ordinary pyogenic organisms.

6. The results of *animal experiments* by Blau, Haymann, and the abstractor agree with the findings in human subjects in showing that tubercular otitis is more severe than ordinary purulent otitis, that the labyrinth is more often involved, and that the invasion of the labyrinth occurs by way of the windows.

7. *Complications*.—The majority of writers hold that tubercular otitis media and interna do not, as a rule, give rise to intracranial complications, though tubercular pachymeningitis externa is frequently met with. On the other hand, Macewen (*Pyogenic Diseases of the Brain and Spinal Cord*, Glasgow, 1893) and Koerner (*Die Otitischen Erkrankungen*, 1907) appear to hold the view that tubercular meningitis, tubercular tumour (or abscess) of the brain, and tubercular affection of the sigmoid sinus not infrequently result from tubercular otitis media. Garelo (*Centralbl. f. Ohrenheilk.*, 1909, S. 207) has demonstrated a tuberculoma of the inner ear and posterior cranial fossa. Cases are on record of hæmorrhage from the internal carotid artery as the result of tubercular erosion of the Eustachian tube extending to the coats of this vessel. Brieger states that purulent leptomeningitis may be due to a tubercular otitis which has become the seat of secondary infection.

8. *The diagnosis* of tubercular otitis is made by attention to the following points:—(a) The clinical characteristics of the case (see paragraph 4). (b) Examination of the ear discharge for tubercle bacilli by staining films with carbol-fuchsin in the usual way and then decolorising with sulphuric acid in alcohol. This method eliminates those organisms which are acid-fast but not *acid- and alcohol-fast*, as is the tubercle bacillus. (c) The findings at operation—enlarged caseous glands, presence of necrosed bone, pale flabby granulations, putty-like pus in the antrum, extensive caries of the bone, tubercular granulations on the dura mater, necrosis of the labyrinthine wall or labyrinth fistula. (d) Microscopic examination of the granulations, or rather of the swollen and infiltrated mucosa removed at operation. (e) Subcutaneous inoculation of the tissue obtained at operation into the groin of a guinea-pig. In order to get rid of mixed infection, this tissue may be previously treated with antiformin or ericolin. In order to determine whether the ear condition is due to the presence of the bovine or of the human type of tubercle bacillus, it is necessary to make cultures on egg medium from the tubercular lesions in the guinea-pig, and then to inoculate rabbits (John Fraser, *Tuberculosis of the Bones and Joints in Children*, London, 1914).

9. *The prognosis* of tubercular otitis media is not favourable, though cures are reported by Biehl, Hegetschweiler, Moxer, Muck, Barany, and Brieger (*Centralbl. f. Ohrenheilk.*, 1903-1913).

10. *Treatment*.—Brieger holds that the indications for treatment are the same as those in the ordinary purulent forms of otitis media and mastoiditis. Blegvad says that we should operate at once, whenever the tubercular nature of the disease is recognised. Ruttin, on the other hand, holds the opinion that tubercular otitis should only be operated upon if the patient is suffering severe pain, as it is hopeless to get rid of all the disease, and E. Urbantschitsch believes that operation on cases of tubercular otitis may result in a tubercular meningitis or in lighting up a general tuberculosis. Probably the correct position lies between these two extremes. Operation should be performed if the patient is in good condition, but should be omitted if advanced phthisis pulmonalis, tubercular meningitis, or general tuberculosis be present. Even in cases of advanced consumption, however, an operation should be performed if severe pain in the ear be present.

If the infection, as is generally admitted, comes by way of the Eustachian tube, and involves the tympanic cavity as well as the mastoid antrum, it is useless to perform the Schwartz operation, which only deals with the mastoid process. The radical operation is therefore indicated in all cases except those rare fungoid forms in which there is an apparently primary (hæmatogenous) involvement of the mastoid process. When the radical operation is performed, it is an advantage to expose the dura mater of the middle and posterior fossa over a considerable area, as this membrane forms a much better barrier than the bone against the spread of tubercular disease. (Adenoids, if present, should not be removed at the time of the mastoid operation, but may be dealt with a week later.) Even the most extensive operation does not remove the last vestige of disease, *e.g.* in the middle of the Eustachian tube. One must therefore depend to a great extent on the resisting powers of the patient, and for this reason it is very important that sanatoria should be provided for the after-treatment of these ear cases among other forms of "surgical" tuberculosis. It is useless to send the children back to the slums, from which so many of them come. Some writers call attention to the good effect of exposing patients, after operation, to the rays of the sun, while others claim that they have used radium with success in tubercular ulceration of the external meatus, while admitting that it is useless in tubercular otitis media. Muck (*Zeitschr. f. Ohrenheilk.*, Bd. liii. S. 132) advocates the use of suction in the treatment of tubercular otitis media. He employs a cupping glass on Bier's method. The negative pressure should be slight at first and should be slowly increased. Muck notes that patients feel very tired during these suction sittings, and admits that the "cure" in

very protracted. The abstractor believes that, after the radical mastoid operation has been performed, he has seen benefit result from the application of Pfannenstiel's method of treating tuberculosis of the nasal mucous membrane. Sodium iodide is given internally in increasing doses, and the operation cavity is packed each day with strips of gauze soaked in peroxide of hydrogen. J. S. F.

PATHOLOGY.

UNDER THE CHARGE OF

THEODORE SHENNAN, M.D., AND JAMES MILLER, M.D.

SENSITISED VACCINES.

A VACCINE may be defined as the virus of a disease introduced into the body of an animal with a view to the prevention or cure of that disease. As a rule the virus is attenuated in some way or killed by heat. In most instances the vaccine consists of an emulsion in normal saline of the specific organism. In addition to the bodies of germs, the fluid will contain the products of the disintegration of other germs. When such an emulsion is introduced under the skin of a patient, the poisons already present in the saline through the disintegration of germs are absorbed, and by their action upon the immunising mechanism of the body stimulate the production of antagonistic bodies. The germs which still retain their form are relatively slowly disintegrated by means of the leucocytes and body fluids, thus eventually acting in the same way.

If the vaccine is introduced into an immunised or partially immunised animal, this latter process of the disintegration of the bodies of germs will be expedited, owing to the presence of the specific immune body, which in the presence of complement will effect a relatively rapid bacteriolysis. A similar result is brought about by the use of sensitised vaccines. These sensitised vaccines are prepared by bringing the germ which is to be used into contact with the serum of an animal immunised against the germ—in other words, with the specific immune body of the germ. A certain amount of this immune body is taken up by the bodies of the organisms. The germ in this condition is sensitised, and when brought into contact with complement, as would be the case on introduction into the body of any animal whether immunised or not, bacteriolysis at once occurs and the poisons contained within the body of the germ immediately become available. Theoretically, therefore, under the use of sensitised vaccines, the stimulus to the production of more antibodies should reach the immunising mechanism more rapidly. That is the fundamental argument for the use of such vaccines either in the prevention or cure of bacterial diseases.

Among the first to employ these vaccines were Roux and Besredka, who prepared plague, cholera, and typhoid vaccines in the following way:—A 48-hour culture was emulsified in normal saline and heated to 60° C. for one hour. The emulsion was then mixed with a quantity of anti-serum and allowed to remain at room temperature for 12 hours. At the end of this time the bacilli had fallen to the bottom of the flask, the supernatant fluid was decanted, and the deposit of sensitised germs washed several times with normal saline in order to get rid of all traces of the serum. In the case of the typhoid and cholera vaccines the germs were treated with the serum before being heated. Besredka (*Bulletin de l'Institut Pasteur*, 1910, t. viii. p. 241) insists upon the importance of washing the germs free from all trace of serum after they have been sensitised. The action of such serum is prejudicial to the duration of the immunity. At the same time the sensitised organisms should not remain in saline too long before use, as they tend to give up some of their attached immune body. The washing process should therefore be carried out rapidly and all the operations should be completed within 24 hours. The chief advantages of these vaccines are, in the first place, the rapidity with which immunity develops. In the case of plague, mice become refractory to a fatal dose of the virus within 48 hours after treatment. Guinea-pigs treated with sensitised typhoid or cholera vaccines show evidence of a degree of immunity within 24 hours. In the second place, the immunity is durable. It lasts at least as long as the immunity produced by ordinary vaccines, although it is not possible to state with exactness the duration of either type of immunity. The anti-cholera and anti-typhoid vaccines confer an immunity lasting, in the case of guinea-pigs, approximately five months. A further advantage is that the administration is not followed by the unpleasant results which occasionally attend the use of the ordinary non-sensitised anti-plague, etc., vaccines.

Subsequent to the publication of the method of Roux and Besredka as applied to plague, cholera, and typhoid, a number of sensitised vaccines have been employed by others. Marie has applied it to the case of anti-rabic vaccination with excellent results, especially in cases which come for treatment some time after having been bitten, and in cases where the bite is a severe one. The method has also been adopted in the case of dysentery (*Annales de l'Institut Pasteur*, t. xxiii. p. 677) and many other more common microbic infections.

Calmette and Guérin have used, with success, a sensitised tubercle vaccine by mixing the serum of animals immunised against tubercle bacilli with cultures of the organism grown on special media (*Comptes Rendus Acad. Sciences*, 4th July 1910).

It is a generally recognised principle in the preparation of vaccines that the organism or virus should be damaged as little as possible.

When the usual method of killing the germ by the aid of heat is employed, the temperature at which this is effected is the minimum for the purpose. Thus vaccines are heated to 56° or 60° C. for an hour. A much shorter period of time would suffice if a higher temperature were used, but the delicate poisons upon whose integrity the efficacy of the vaccine depends would be damaged or destroyed. Sometimes instead of actually killing the germ it is weakened or attenuated, as in anti-rabic vaccination. More recently the principle of administering living germs of unaltered virulence has been employed with a view to obtaining the maximum result. This principle has also been employed in the case of sensitised vaccines, and for some years Besredka has prepared a sensitised vaccine of living typhoid bacilli. His experience and the experience of others who have used the vaccine is of special interest at the present moment.

Metchnikoff and Besredka (*Annales de l'Institut Pasteur*, 1913, t. xxvii, p. 597) carried out a number of experiments with this sensitised living typhoid vaccine, and found that, in the monkey, the organisms remain alive in the subcutaneous tissue for five days after injection. On the other hand, no living typhoid bacilli were found either in the urine or the stools. Moreover, in no instance were living organisms found in the blood of the animals, although the doses employed were massive. Thus it follows that animals inoculated in this way with sensitised living bacilli do not become "carriers." Monkeys inoculated thus do not develop typhoid fever on subsequent feeding with bacilli, although control animals after an incubation period of four days developed the disease.

In a further communication (*ibid.*, p. 607) Besredka gives his experience with this new method of anti-typhoid inoculation. The experience embraces a period of two years. The first case was inoculated on 7th June 1911. It was that of a woman, æt. 40, into whose subcutaneous tissue 500 million living sensitised typhoid bacilli were introduced. During three days following the injection the patient showed an erythematous area the size of a five franc piece, which was a little painful to the touch. The temperature, however, remained normal and the general condition of the patient left nothing to be desired. Encouraged by this first experiment a number of other cases were similarly inoculated, with uniformly favourable results. To take one series of cases. An asylum of 950 patients was selected in which during 20 years several cases of typhoid fever had occurred each year. Approximately half the patients (516) were inoculated with the living sensitised vaccine. Practically no reaction occurred in the inoculated patients. During the year following, although 4 cases of typhoid fever occurred amongst the unvaccinated, not a single case occurred amongst the vaccinated.

These results calmed the fears of the profession in France, which

had at first looked somewhat askance at the new method. The vaccine was prepared in large quantity and placed at the disposal of medical men for vaccinating travellers, soldiers, etc., going to typhoid-infested countries. At the time at which this paper was written (summer 1913) ten thousand doses had been distributed. In spite of a special request accompanying each dose of vaccine that any unfortunate circumstance following vaccination should be reported to Paris, no such report arrived. Besredka had himself inoculated with his vaccine, and beyond slight pain and swelling at the point of injection he noted nothing. A second inoculation was followed by even less in the way of local reaction, and evidence of general reaction was entirely absent. Very occasionally a marked local and general reaction has occurred.

Even in the case of patients already suffering from typhoid fever vaccination with the living sensitised organism may be practised without fear of bad results. In fact, cases thus treated have shown marked evidence of improvement.

Similar investigations to those carried out in monkeys treated with the vaccine were carried out in the human subject. The stools were systematically examined for the presence of living typhoid bacilli, but without result. Moreover, the blood of many vaccinated cases was examined at intervals, with similar negative results. It may be concluded that, as in the case of the monkey, the living bacilli remain localised and do not enter the blood or intestinal tract.

In conclusion, the experience of medical men outside France may be given. Three medical officers of the Roumanian Army give in the *Annales de l'Institut Pasteur* (1915, t. xxix. p. 105) their experience with the Besredka anti-typhoid vaccine.

In one regiment 598 men were vaccinated, in another 634. In each company half the men were vaccinated, the other half not being so treated. Two injections were given into the muscle of the buttock, the second dose containing double the number of bacilli. Iodine was used as a surface antiseptic. The injections were given at eight days' interval. Following the inoculation there was a local reaction, with pain and œdema lasting about 48 hours. In 20 per cent. of cases there was a rise of temperature, as a rule slight. The general reaction was most marked in cases in which a small vessel was damaged during the operation.

As regards results:—In one of the regiments treated a case of typhoid fever developed a few months after the inoculation took place. It occurred in a soldier who had not been vaccinated. In the other regiment 8 cases occurred, all in men who had not been treated. In no case was the typhoid bacillus found in the stools of the inoculated men.

It is hardly necessary to say that the anti-typhoid vaccine employed in this country is an emulsion of the typhoid bacillus killed by heat and not sensitised.

J. M.

NEW BOOKS.

Radiography, X-Ray Therapeutics, and Radium Therapy. By ROBERT KNOX, M.D.(Lond.). Pp. xxi. + 406. With 311 Illustrations. London: A. & C. Black, Ltd. 1915. Price 25s. net.

It is only twenty years since Wilhelm Konrad Röntgen, in the course of some electrical experiments in the physical laboratory at Würzburg, placed his hand between the discharge tube and a fluorescent screen and was startled to see the outline of his bones cast as a shadow on the screen. Few accidental observations have had such immediate and far-reaching effects. Within a few months the Röntgen rays were usefully applied to aid in the recognition of injuries of bones and in the detection of foreign bodies in the tissues, and ere long a new and highly important specialty was introduced to practical medicine. The radiographer became an essential factor in every hospital staff; vast sums of money were expended on appliances, and a torrent of radiographic literature flooded the medical press. The specialty has rapidly developed on gradually broadening lines, and the utility of various forms of radio-activity in diagnosis and treatment has been demonstrated.

In the work now before us we have an able exposition of the present-day aspects of this branch of applied electrical science. Dr. Knox has, wisely we think, avoided theoretical considerations as far as possible, and has made his book essentially a practical one. To the beginner who desires to obtain a working knowledge of the technique of radiography and of radiation therapy the work is invaluable; the specialist will find in it the recorded experience of one who is recognised as a master in his department; and to the mere physician and surgeon it furnishes an authoritative summary of what can be learned from or done by the various forms of radio-activity.

The subject-matter is divided into two sections dealing respectively with radiography and radiation therapeutics. In the opening chapter the sources of electric energy are discussed, and the requisite apparatus is fully and clearly illustrated in this and the succeeding sections. The production of the radiograph is then taken up and valuable information is given regarding the exposure of the plate and its subsequent development and printing. The photographic details are eminently practical, and if carefully followed by one who has some elementary knowledge of photography will enable satisfactory results to be obtained.

Considerable attention is devoted to the localisation of foreign bodies, a subject of outstanding importance at the present moment and likely to be so for some considerable time. This section will be welcomed by radiographers attached to military hospitals.

A large section is taken up with the radiographic appearances in injuries and diseases of bones and joints, and the X-ray examination of the thorax, abdomen, urinary organs, and other parts of the body are exhaustively dealt with. Special mention must be made of the beautiful series of plates, produced in negative and positive, with which these sections are illustrated.

Part II. is devoted to radiation therapeutics, by X-rays and by radium. The biological reaction of tissues to radiation is fully described and illustrated by a series of excellent photomicrographs. The dangers incident to the use of radiation therapy are pointed out, after which the application of the X-rays to various lesions is described and the value of the treatment judicially estimated—with perhaps a slight natural bias towards optimism.

A short section on the physics of radium is contributed by Mr. C. E. S. Phillips, F.R.S.E., and the practical application of radium to disease is then discussed. The work concludes with a chapter on the combined use of radium and X-rays in the treatment of malignant disease, a method in which the author places considerable faith.

The name of the publishers is sufficient guarantee that the *format* of the work is worthy of the text. The type is clear, the plate illustrations of a high standard of excellence, a glossary of electrical terms proves most helpful to the non-expert reader, and a full index renders the work easy of reference.

We have said enough to indicate that we consider this a book of outstanding value, and we confidently recommend it to those of our readers who desire to possess an authoritative work on the subjects with which it deals. We confess to a feeling of satisfaction that it appears in the Edinburgh Medical Series.

The Heart in Early Life. By G. A. SUTHERLAND, M.D. Pp. xvi. + 211.

London: Henry Frowde and Hodder & Stoughton. 1914.

Price 6s. net (Oxford Medical Publications).

IN this little book Dr. Sutherland seeks to apply the teachings of modern work to disease of the heart in children. For various reasons the polygraph and electro-cardiograph have not been very extensively employed in the study of cardiac lesions in early life, and Dr. Sutherland's is, we think, the first systematic contribution to the subject. He writes modestly, and does not claim for the new methods more than they justly deserve, and his conclusions are throughout sound. The chief facts on which he insists are full of practical importance. Functional disturbances ought to be clearly recognised for what they are, and should not be allowed to parade as "weak heart," and condemn the patient to an inactive or quasi-invalid existence. In organic heart disease we have to do with an inflammation—a carditis, as the late Dr. Sturges pointed out more than twenty years ago—and not, as in

later life, with degenerative or fibrotic changes. Hence cardiac tonics play a much smaller, and constitutional treatment a much greater, rôle in children than in adults. Dr. Sutherland also urges very strongly, and quite rightly, that the functional capacity of the heart is the real measure of what treatment (if any) the patient requires. The only criticism, and it is a small one, is that his repeated insistence that a murmur, *per se*, does not indicate any particular treatment, is surely scarcely necessary at this time of day. Without in any way depreciating the great debt we owe to modern students of cardiac disease, and admitting that up to the last few years murmurs have attracted an undue amount of attention, it may be claimed that for the last twenty years at least the mere presence of a murmur has not been generally regarded as a reason for treatment. A very valuable part of Dr. Sutherland's book is the section dealing with tachycardia in children, a subject as to which we as yet know very little, and that little chiefly through the author's work. Altogether Dr. Sutherland has set down within small compass and in a very readable way the main facts about heart disease in children, and his book is one which should be in the hands of all practitioners, for it is they, not specialists, who see these cases early, when only is there any reasonable probability of cure.

The Minor Horrors of War. By A. E. SHIPLEY, Sc.D., F.R.S.
Pp. xviii. + 166. London: Smith, Elder & Co. 1915. Price
1s. 6d. net.

As this notice is being written the announcement is made that the first edition of Dr. Shipley's book is exhausted and that a second is in the press. This is no surprise, for the "minor horrors" are discussed (as the author says) in a certain spirit of gaiety which lends fascination to the otherwise unattractive invertebrates—lice, bugs, flies, mites, and leeches—which are the subject of his discourse. The chapters dealing with these parasites—or shall we call them vermin?—appeared in the columns of the *British Medical Journal*, and they thoroughly merit separate publication in book form. Lice have been the subject of much investigation at Cambridge—incubated, as it were, in test tubes nestling against the bodies of the researchers. It is difficult to keep them alive (when they are wanted), more difficult still to hatch the eggs, and most difficult of all to rear the larva, so poor is our best attempt to imitate Nature by art. One of the chief results of these experiments is the fact that unless lice are fed regularly they soon die. Verminous clothes which have been discarded for a week will usually contain only dead lice. Various remedies for personal use have been suggested—wearing cords impregnated with mercurial ointment, bags of sulphur, etc. There is some evidence that the latter is effective. The bed bug—"The painted child of dirt, that stinks and stings," as Pope sang it—is commonly held to have no redeeming virtues at all;

but Dr. Shipley doubts whether the crime of transmitting typhus can be laid at its door. Unlike the louse, the bug can live for long periods without food. Incarcerated in a pill-box for a year specimens remained capable of reproduction, though they had become so emaciated that the *Times* ("only the larger print, such as the leading articles and letters from admirals") could be read through them. On all counts, like the unfortunate panel before Lord Braxfield, they are "nane the waur of a good hanging," and sulphur fumes for four or five hours, or the local use of petroleum, or burning woodwork with painters' flares, seems the best way to execute them. As these notes indicate, Dr. Shipley's confession that he writes in a spirit of gaiety is true; let him be assured that no sort of apology is required. Burns thought the louse a worthy subject for his muse; and as the quotations in Dr. Shipley's book show, all these pests of man have had much wit and humour expended on them. Dr. Shipley's valuable and thoroughly scientific treatise, besides being the repository of much recent research, is made the more readable by his literary references and illustrations.

An Introduction to the Study of Colour Vision. By J. HERBERT PARSONS, D.Sc., F.R.C.S. Pp. 308. With 75 Illustrations. Cambridge: At the University Press. 1915. Price 12s. 6d. net.

AS the vast literature on colour vision consists almost entirely of monographs written in support of some particular theory, it is practically impossible for the student to obtain a general and unbiassed view of this important subject. The present volume is written with the object of separating the best-established facts from the theories regarding colour vision, and discussing thereafter the chief theories in the light of these facts. Accordingly the work is divided into three main parts:—

- I. The chief facts of normal colour vision.
- II. The chief facts of colour blindness.
- III. The chief theories of colour vision.

Each part is divided and subdivided into sections and chapters. Part I. deals with such subjects as the bases of colour vision, the spectrum as seen by the light-adapted eye, and the evolution of colour vision, all of which receive masterly treatment.

Part II., dealing with the chief facts of colour blindness, opens with a careful description of colour names, dichromatic vision, anomalous trichromatic vision, and monochromatic vision, each section being described in a clear and lucid manner.

In Part III., consisting of 98 pages, we find the chief theories of colour vision fully and systematically stated. This is the practical part of the work, and, on that account, will be regarded by the majority of readers as the most interesting of all.

Exception can in some instances be taken to the author's conclusions, yet, after a careful perusal, we have no hesitation in saying that Mr. Parsons' new book is both comprehensive and authoritative, and up to the high standard of excellence found in his previous publications.

An Introduction to School Hygiene. By W. B. DRUMMOND, M.B., F.R.C.P. Pp. x. + 237. London: Edward Arnold. 1915. Price 3s. 6d.

THIS book is specially intended for teachers and students of education, and, to use the author's words, "contains 'what every teacher ought to know'" about the hygiene of school children. Physiology is omitted, and questions of pure sanitation are briefly passed over. Thus the book really deals with the hygiene of childhood in the strict sense—or rather, to quote from the preface again, with everything that "interferes with John's health, in school or out." The various subjects dealt with are nutrition and growth, work, exercise, nervous anomalies, circulation, respiration, the special senses, and infectious diseases. The information given is always sound and scientific, and is just such as a teacher should have more or less at his finger ends. Dr. Drummond's writing is clear and to the point, the book is quite free from padding, and it seems to us that the selection of facts is extremely good and the balance between the essential and non-essential well preserved. Quite apart from its value as a permanent possession, the book will be found well adapted for the use of students preparing for an examination, although it is by no means of the nature of a cram book. Dr. Drummond has already written several books on subjects allied to this, and we feel sure that the volume under review will enhance his reputation as an authority on medico-educational problems.

NEW EDITIONS.

Encyclopædia Medica. Second Edition. Under the general editorship of J. W. BALLANTYNE, M.D., F.R.C.P. Vol. I. "Abattoirs" to "Asphyxia." Pp. xvi. + 744. Edinburgh: W. Green & Son, Ltd. 1915. Price 20s. net.

It is now some fifteen years since the first volume of the *Encyclopædia Medica*, which represented a new departure among medical publications, was placed before the medical profession. The complete work was issued in the course of about five years, and afforded a comprehensive survey of the medical sciences as they existed at the time. It was, as has been stated, a new departure, and for a parallel work, in this country at least, we have to go back to *Todd's Cyclopædia of Anatomy and Physiology*, published in the 'thirties and 'forties of last century,

which had an analogous object, and gives us, as the *Encyclopædia Medica* does, a synopsis of the state of current medical knowledge at the time.

Medical books, however, go out of date rapidly; how quickly they depreciate commercially a glance at any second-hand catalogue shows. This rapid depreciation is a measure of the need for constant revision and re-editing; and although it is fifteen years since the first and ten years since the last volume of the original *Encyclopædia Medica* appeared, the interval has not been wasted, for under the editorship of Dr. J. W. Ballantyne the encyclopædia has already undergone several preliminary revisals, which have paved the way for the second edition. There has already been published an encyclopædia and dictionary, which consisted of a partially revised work with a great deal of purely dictionary matter added; a supplementary volume of entirely new matter, covering the period of 1906 to 1910; and a further encyclopædia (*Green's Encyclopædia of Medicine and Surgery*), still more thoroughly revised, and with a great many illustrations added. These reissues, however, differ from the second edition now under review, in that the alterations made were chiefly in the direction of adding new matter without much deletion of the obsolete—the articles, for the most part, being allowed to stand as originally written. Now, for the first time, has each article, whether it appeared in the first instance in the original encyclopædia, or was written for one of the dictionaries, or the supplementary volume, been revised or rewritten by its author or by some other competent authority; the time of adding and patching has gone by, and what is practically a new encyclopædia is being prepared.

In Volume I. there are forty-eight principal articles, of which those entitled Acute Abdomen (two), Abdominal Section, Acidosis, Acromegaly, Adenoids, Alkalies, Basle Anatomical Nomenclature, Antenatal Pathology, and Asepsis in Midwifery—ten in all—are new. Twenty-seven old articles have been revised by the original authors, and eleven have been revised by others than the original authors—for the most part because death or retirement from work has rendered any other course impossible.

It is, of course, out of the question to review the individual articles at any great length; but the impressions received while looking through the volume are two: First, the high level of merit which the various articles attain and the extent to which they embody the latest work; secondly, on comparing this with the old edition it was, in many cases, striking how little change had been required in some of the articles.

To have stood the test of fifteen years proves, better than any contemporary laudation, that the *Encyclopædia Medica* has attained a definite standard of excellence difficult to better.

Among the new articles special mention should be made of Mr. Scott Carmichael's "Acute Abdomen in Children," which is most in-

teresting and instructive, and bears all the marks of accurate and extensive clinical observation. Dr. Graham Brown's article on "Acromegaly" gives a good account of the disease, and is well illustrated. Dr. J. S. Fraser treats the subject of "Adenoids" in a comprehensive manner. Perhaps the most important new article is that on the "Basle Anatomical Nomenclature," wherein are arranged in parallel columns the ordinary English anatomical names, the Latin terms agreed on at Basle, and the suggested English equivalents. The tables extend to ninety pages, and will prove invaluable for reference; they have been compiled by Dr. E. B. Jamieson. It should, perhaps, be stated that in this edition of the encyclopædia the ordinary nomenclature is used. Among the articles revised by their authors, a melancholy interest attaches to that on "Adolescent Insanity" by Sir Thomas Clouston. The relationship of his conception of adolescent insanity to Kraepelin's dementia precox is shortly discussed, and we feel assured that many future readers of the encyclopædia will be glad to think that in this article they have the matured experience of perhaps the greatest alienist this country has produced.

In addition to the principal articles indexed, there are a number of shorter ones—some new, others revised from the older editions of the encyclopædia or dictionary. The bulk of the purely dictionary definitions and many cross-references have, however, been omitted, and in general the original plan of the work has been adhered to. The volume is very fully illustrated.

Well as the contributors have done, their labours would have been rendered unfruitful but for the skill of the editor; only those who know can understand the amount of work required to edit a book of this kind satisfactorily, and Dr. Ballantyne can now be labelled *hors concours* among medical editors. The publishers also, deserve hearty congratulation on the rejuvenation of the enterprise on which they fifteen years ago embarked.

Diseases of the Skin. By JAMES H. SEQUEIRA, M.D.(Lond.), F.R.C.P., F.R.C.S., Physician to the Skin Department and Lecturer on Dermatology at the London Hospital. Second Edition. Pp xiv. + 650. With 286 Illustrations. London: J. & A. Churchill. 1915. Price 25s. net.

A VOLUME of this kind caters for two classes of readers the requirements of which differ considerably. One is the specialist, or those preparing to become such. They require a handy manual, embodying the latest views and containing descriptions of the most recently discovered cutaneous affections. The details need not be given at great length, unless where error might arise were these not furnished. But it is essential that full references to original papers contained in one or other of the journals devoted to the subject, or to articles bearing on

the question in the general periodical literature of medicine, be provided. The other class to whom a treatise of this nature appeals is that of the general practitioner. While rare skin diseases do crop up in his practice at times, his work lies much more in the recognition and management of common skin affections, so that he may be able to do the best possible for his patient under circumstances where consultation with a specialist is unadvisable or out of the question. From a somewhat careful examination we think that the needs of both classes are very fairly provided for by Dr. Sequeira, though it is not an easy task to reconcile the demands of both types. From the point of view of the general practitioner, we may take the section on eczema as a specimen. It covers seventeen pages. The definition and etiology are dealt with succinctly and clearly. The local and general predisposing causes are shown to be comprehensive and well worth careful study, since much may be gathered from these prior to instituting a rational treatment. With the exception of the inset representing impetiginous eczema in a strumous subject, we cannot regard the illustrations as peculiarly happy. Under local measures the value of the boric starch poultice is admitted, yet the directions for its application are defective. To be used successfully as a preliminary three points are essential—one, that the starch, after being made, has set into a soft, firm, cool jelly; another, that this be spread thickly on muslin; and lastly, that the muslin be folded over the starch before it is put on the skin. No one of these can be found in the rules for preparing the poultice. Success in the cure of skin ailments, more than in any class of disorders, depends on the observance of minutiae. The book is amply illustrated and many are quite typical, but the tinting in the coloured ones is frequently too delicate; there is a want of boldness. Much has been done to bring this new edition up to date, and, rightly used, it will be found a trustworthy guide.

Abdominal Operations. By Sir BERKELEY MOYNIHAN. Third Edition.
Vol. I., pp. 480. Vol. II., pp. 490. With 371 Illustrations.
London: W. B. Saunders Co. 1914. Price 42s. net.

WE welcome a new edition of Sir Berkeley Moynihan's work, which reflects the many important advances which have been made in the surgery of the abdomen since the former edition appeared. The discussion of the surgery of each viscus is prefaced by an interesting summary of the historical aspect of the operative procedures and a detailed anatomical description. Full consideration is given to the opinions and practice of the authorities on each subject; and the author's own methods are described in detail, the reasons for his preferences being fully set forth. Clinical histories are introduced where they serve to amplify and illustrate the text, and statistical evidence is not wanting as to the results of different operations.

The writer's facile style, the clearness of the type, and the excellence of the illustrations all go to make the book one which is read with pleasure as well as profit. Each successive edition of such a work must find a place in the operating surgeon's library.

The Difficulties and Emergencies of Obstetric Practice. By COMYNS BERKELEY and VICTOR BONNEY. Second Edition. Pp. 807. With 302 Illustrations. London: J. & A. Churchill. 1915. Price 24s. net.

THE call for a second edition of this book within three years indicates that the favourable impression which this journal originally formed of it has been widely shared. In the present edition the text has been thoroughly revised, and a good deal of new matter and illustrations have been added. Some of the weaknesses, however, to which notice was directed in the original review have not yet received their due attention from the authors.

In stating any opinion of the book it is only fair to remember the specific and professed aim of the work, which is "to afford guidance in plain terms to the practitioner" when in difficulties. This it does to admiration. Indeed, it is this very admiration which makes one regret that the authors felt themselves compelled—and rightly so—by the aim of the book to be brief and dogmatic, and to omit all references to the literature and history of the various subjects. The result is a glorified dictionary of obstetric treatment, not free from the failings inevitably associated with any such scheme. But the dictionary is so obviously good that one regrets it was not allowed to grow into an encyclopædia.

An Introduction to Midwifery. By ARCHIBALD DONALD, M.D., Manchester. Seventh Edition. Pp. 188. With 71 Illustrations. London: Charles Griffin & Co., Ltd. 1915. Price 5s.

THIS handbook is intended by the author to serve as an introduction to midwifery for students just beginning the practice of it, but it has also been his intention that it should prove equally suitable for the use of midwives. We think the author has more than succeeded in his endeavour to meet the wants of both, and the fact that the book has now reached its seventh edition proves its popularity with student and midwife alike. To midwives we think the book should prove of exceptional help, as it so clearly defines what is the scope of the midwife's work, and lays down definitely her course of action when she encounters cases of abnormal labour. The illustrations are simple but clear. In a useful and important appendix, the main points in the rules framed by the Midwives Board are quoted. We have no doubt the book will meet with the same popular demand as have previous editions.

NOTES ON BOOKS.

THE PRACTICAL MEDICINE SERIES, 1914. The Year Book Publishers, Chicago, 1915. *Nervous and Mental Diseases*. Edited by Hugh T. Patrick and Peter Bassoe, M.D. This is a compact volume which deals with the work that has been done during the year on nervous and mental diseases. In a most clear and concise way are given extracts of papers which have been produced; these are then briefly discussed. The headings are clear and well arranged, and the book is most pleasant to read. The reading on the Abderhalden tests, on syphilitic diseases and on pellagra, is specially good. This is an excellent book for those who strive to keep up to date in their work and cannot read through the enormous amount of literature which must be sought through tediously before even an outline of the subjects can be got.

Obstetrics. Edited by Joseph Lee, M.D., and Herbert Stowe, M.D., 1915. This volume is arranged in four parts or sections, each of which contains extracts from papers bearing on recent work done, and in some instances useful criticisms by the editor. In Part I., which deals with pregnancy, one of the most important references is to recent work in the sero-diagnosis of pregnancy, and in particular, to the value of Abderhalden's test. The editor points out that the results obtained by recent workers in this field are somewhat contradictory, and tend to throw doubt on the value of the test as a specific reaction to pregnancy alone. The editor accordingly remarks, "we must still withhold final judgment." In the subject of eclampsia we note the results of treatment by hypophyseal extract, but we regret to find no reference to the use of veratrone, nor to the record of the successful work—both clinical and experimental—with veratrone in eclampsia done by Dr. Haultain.

Materia Medica and Therapeutics, Preventive Medicine, Climatology, edited by G. Butler, H. B. Favill, Norman Bridge. The section of materia medica and therapeutics is the largest, occupying 280 pages. Of this, again, Part I. is of chief importance, 180 pages, or about one half the volume, being devoted to the consideration of drugs. The arrangement is alphabetical, and is therefore convenient for easy reference. Part II. deals with organ extracts, vaccines, and serum, and Part III. with electricity, Röntgen rays, radium, and radio-active substances. The section on preventive medicine, occupying about 70 pages, has chapters on infectious disease, industrial and social diseases, general sanitation, the physician and public health work, eugenics. The volume is one which can be generally recommended to the practitioner. References to the original papers are given at the foot of each page.

Husband's *Students' Pocket Prescriber* (E. & S. Livingstone, 1915, price 1s. 6d.) has long had a vogue among those to whom it is addressed. The fifth edition, revised in accordance with the British Pharmacopœia (1914) by Dr. D. M. Macdonald, will be welcome.

The Way of the Red Cross, by E. Charles Vivian and J. E. Hodder Williams (Hodder & Stoughton, price 2s. 6d.), is a series of cleverly-written sketches reflecting the multifarious activities of the organisations directed by the British Red Cross Society and the Order of St. John abroad and at home. The book is introduced by a prefatory letter by Queen Alexandra, and the profits derived from its sale are to go towards the fund for the sick and wounded. It cannot fail to inform those who are still in ignorance, if any such there be, of the thousand and one ways in which the women of the country have risen to meet the calls made upon them by the war. Only those who have seen their work can estimate its value, not only to the sick and wounded for whom they minister, but to themselves. "These women will never be the same again," the authors say; "they have seen the ugly things of life." Nay, rather, they have done the beautiful things of life, and it is this that has wrought the change. The book contains many stories of the men in hospital who have played their part so bravely in the field. We could have wished that, in working these up, the authors had shown more restraint and had spared us some of the horrors of the military hospital. Nor was it advisable in such a work to dwell upon the alleged atrocities of the enemy, and so to minister to the gospel of hate. Such, surely, is not "the way of the Red Cross."

Transactions of the Thirty-sixth Annual Meeting of the American Laryngological Association, held at Atlantic City, N.J. (pp. 333, New York, 1914). This volume contains articles by many of the best-known American otologists and laryngologists. The presidential address, by Thomas Hubbard, is devoted to the subject of prevention of diseases of the air passages. Chronic nasal catarrh he attributes in great measure to improper ventilation of houses and public buildings. The average temperature of interiors in America in winter he states to be about 70° F., with a relative humidity of 20 per cent. In contrast with this he compares the outside temperature, which he puts at 30°, with a relative humidity of 80 per cent. The sudden change of surroundings occasioned by entering or leaving such an atmosphere causes great congestion of the turbinates, which predisposes to catarrh, etc. More shock is occasioned by the difference of humidity than that in temperature.

Chevalier Jackson contributes an article upon the limitations of bronchoscopy. In it he discusses the cases of failure to extract foreign bodies by bronchoscopy, and advises that thoracotomy should not be recommended until two skilled bronchoscopists have previously failed to extract them.

An interesting case is reported of acute suppurative thyroiditis with a perforation of the trachea, ending fatally.

The book contains many other interesting articles besides, and is well worthy of perusal.

BOOKS RECEIVED.

BENNETT, R. R. <i>Materia Medica and Pharmacy. Third Edition</i>	(H. K. Lewis)	4s. 6d.
BULKLEY, L. DUNCAN. <i>Cancer and its Cause and Treatment</i>	(P. B. Hoeber)	dol. 1.50.
CAMERON, H. C. <i>Diet and Disease in Infancy</i>	(J. & A. Churchill)	8s. 6d.
CATECHISM Series—Botany. Part II. <i>Second Edition</i>	(E. & S. Livingstone)	1s.
FOSTER, NELLIS B. <i>Diabetes Mellitus</i>	(J. B. Lippincott Co.)	—
GARRISON, F. H. <i>John Shaw Billings: A Memoir</i>	(G. P. Putnam's Sons)	10s. 6d.
LELEAN, P. S. <i>Sanitation in War</i>	(J. & A. Churchill)	5s.
LENZMANN, RICHARD. <i>Emergencies in Medical Practice</i>	(Bale, Sons & Danielsson, Ltd.)	21s.
MITCHELL, F. W. D. <i>A Key to Health and Long Life</i>	(C. W. Daniel, Ltd.)	3s. 6d.
MOORE, N. <i>St. Bartholomew's Hospital in Peace and War</i>	(Cambridge University Press)	2s.
MOWAT, H. <i>X-Rays: How to Produce and Interpret Them</i>	(Frowde, and Hodder & Staughton)	8s. 6d.
PHILLIPS, L. P. <i>Amoebiasis and the Dysenteries</i>	(H. K. Lewis)	6s. 6d.
REPORTS from the Laboratory of the Royal College of Physicians, Edinburgh, 1915.		—
Vol. XIII.	(Oliver & Boyd)	—
THE Medical Annual, 1915	(J. Wright & Sons, Ltd.)	10s.
THOMPSON, C. J. S. <i>A Compendium of the Pharmacopoeias and Formularies. Fifth Edition</i>	(Bale, Sons & Danielsson, Ltd.)	5s.
TODD, T. W. <i>The Clinical Anatomy of the Gastro-Intestinal Tract</i> (Longmans, Green & Co.)		6s.
TRANSACTIONS of the College of Physicians of Philadelphia, 1914. Vol. XXXVI.	(Philadelphia)	—
WORTH, CLAUD. <i>Squint: Its Causes, Pathology, and Treatment. Fourth Edition</i>	(Bale, Sons & Danielsson, Ltd.)	6s.

ANALYTICAL REPORTS.

VICHY.

It may interest some of our readers to know that notwithstanding the disturbed conditions of France and the general national anxiety, the Syndicat d'Initiative of Vichy announce that the season at Vichy this year will be run practically as usual. The springs, the bathing establishment, and the mechano-therapeutic department will all be available for the treatment of patients, and the usual entertainments will be but slightly curtailed.

ROBINSON'S "PATENT" BARLEY.

(KEEN, ROBINSON & Co.)

There are many occasions on which barley-water is prescribed as a beverage, but as it is prepared from the ordinary cereal it too often proves an insipid and uninviting drink. The special preparation of barley sent out by Messrs. Keen, Robinson & Co. is carefully selected for medical purposes, and the makers issue instructions for the making of barley-water which, if followed, ensure a palatable and sustaining beverage. The outside peel of two lemons, with eight lumps of sugar, is put in two quarts of water and boiled for ten minutes. Two dessert-spoonfuls of the "patent" barley, previously mixed to a smooth paste with a little cold water, are added, and after the mixture has been boiled for five minutes longer it is allowed to cool. It is then strained off through fine muslin, and may be taken plain, with ice, or flavoured to taste.

GRANSALO-FOOD.

(S. HENDERSON & SONS, LTD.)

Further experience of this prepared food for infants and nursing mothers confirms the favourable opinion we have previously expressed regarding it.

EDINBURGH MEDICAL JOURNAL.

EDITORIAL NOTES.

CASUALTIES.

THE following students of medicine have appeared in recent casualty lists :—

KILLED in action in the Dardanelles, Second-Lieutenant HUBERT HENDERSON, 4th Batt. King's Own Scottish Borderers. (University of Edinburgh.)

KILLED in action in the Dardanelles, Second-Lieutenant R. B. BUCHANAN, 5th Batt. Royal Scots Fusiliers. (University of Edinburgh.)

KILLED in action in France, Lieutenant WILLIAM L. SCOTT, 2/5th Batt. Gordon Highlanders. (University of Aberdeen.)

KILLED in action in the Dardanelles, Lieutenant F. CHILTON. (University of Edinburgh.)

HONOURS.

Victoria Cross.—The Victoria Cross has been conferred on Captain FRANCIS ALEXANDER CARON SCRIMGER, Canadian Army Medical Service, Medical Officer, 14th Batt. Royal Montreal Regiment. The official record of the conduct which earned him the distinction is as follows :—

On the afternoon of 25th April 1915, in the neighbourhood of Ypres, when in charge of an advanced dressing station in some farm buildings, which were being heavily shelled by the enemy, he directed under heavy fire the removal of the wounded, and he himself carried a severely wounded officer out of a stable in search of a place of greater safety. When he was unable alone to carry this officer further, he remained with him under fire till help could be obtained. During the very heavy fighting, between 22nd and 25th April, Captain Scrimger displayed continuously, day and night, the greatest devotion to his duty among the wounded at the front.

The following honours have been conferred on members of the medical services :—

The Military Cross.—Captain W. Darling, M.B., F.R.C.S., R.A.M.C., Special Reserve; Captain G. F. Dawson, M.B.(Aberd.), R.A.M.C., attached 2nd Batt. Royal Highlanders; Lieutenant John Marchbank Gillespie, M.B., Ch.B.(Edin.), R.A.M.C.; Lieutenant John Hart M'Nicol, M.B.(Glasgow).

Decoration of the Royal Red Cross.—Miss S. C. M'Intosh, Royal Infirmary, Edinburgh.

Mentioned in Dispatches.—Mr. J. W. Struthers, F.R.C.S., British Red Cross Society, Rouen.

The following Scottish non-commissioned officers and men of the medical service with the Expeditionary Force in France and Flanders have been awarded the *Distinguished Conduct Medal* for conspicuous gallantry and devotion to duty :—

Sergeant T. B. Carter, 19th Field Ambulance, R.A.M.C.; Private J. Cartwright, 14th Field Ambulance, R.A.M.C.; Private W. Herd, R.A.M.C. (attached 8th Batt. Royal Scots); Driver A. J. Hook, British Red Cross Society, No. 4 Motor Ambulance Convoy; Private A. W. Howitt, R.A.M.C.; Sergeant F. Newman, R.A.M.C.; Sergeant H. J. V. Voisey, R.A.M.C.

University of Edinburgh Graduation Ceremonial.

THE Summer Graduation was held in the M'Ewan Hall on 8th July 1915, the Vice-Chancellor in the chair.

The Honorary Degree of Doctor of Laws was conferred on Sir Robert Blair, M.A., B.Sc., London; The Hon. John W. Fortescue, Librarian, Windsor Castle; Professor W. M. Gloag, K.C., University of Glasgow; Professor W. A. Herdman, D.Sc., F.R.S., University of Liverpool; Frederick Niecks, Mus. Doc., lately Reid Professor of Music, University of Edinburgh; Sir Alexander Oliver Riddell of Craiglockhart; Professor Arthur Thomson, M.A., M.B., University of Oxford; Charles Whibley, M.A., Hon. Fellow, Jesus College, Cambridge.

The Degree of Doctor of Medicine was conferred on *Aitken, Robert, Scotland, M.B., Ch.B., 1911; *Bolton, Stuart, England, M.B., Ch.B., 1912; Corbett, Charles Henry (Lieut., R.A.M.C.), England, M.B., Ch.B., 1907; Graham, James, Scotland, M.B., C.M., 1897; Jackson, Annie, England, M.B., Ch.B., 1904; *Johnston, William Henry (B.A., New Zeal.), (Lieut., R.A.M.C.), New Zealand, M.B., Ch.B., 1911; *Macaskill, Donald Cameron (M.A.), Scotland, M.B., Ch.B., 1909; Macleod, Elizabeth, Australia, M.B., Ch.B., 1910; *Maxwell, James, Scotland, M.B., Ch.B., 1912; *Peake, Ernest Cromwell, England, M.B., Ch.B., 1898; Rutherford, Andrew Adams (B.A., R.U.I.), (Lieut., R.A.M.C.), Ireland, M.B., Ch.B., 1912; *Thwaytes, William Glossop (Surg., R.N.), England, M.B., Ch.B., 1912; *Wyon, Guy Alfred (B.Sc., Lond.), (Lieut., R.A.M.C.), England, M.B., Ch.B., 1910.

* Highly Commended for Thesis.

* Commended for Thesis.

The Degrees of Bachelor of Medicine and Bachelor of Surgery were conferred on Anderson, James Coburn, Ireland ; Anderson, James Macmillan, Scotland (2nd class Hons.) ; Armstrong, John Scaife, England ; Baillie, Frederick William Watson, Jamaica, B.W.I. (2nd class Hons.) ; Barkley, Thomas Yuille, Scotland ; Briwer, Hendrik Johannes Petrus, South Africa ; Campbell, James Fraser Muir, Scotland ; Christie, William Melville, Scotland ; Clark, Arthur Gruchy, New Zealand ; Clark, Thomas Lindsay, Scotland ; Clarke, Andrew Robert Fausset, England (Lieut., R.A.M.C. (S.R.)) ; Clarke, Ian Alexander, Scotland ; Cochrane, William Alexander, Scotland (1st class Hons.) ; Coetzee, Cornelius Hermanus Hubertus, South Africa (Lieut., R.F.A.) ; Cooper, Moses Kuper, South Africa ; Daniel, Marcus Fitzgerald, Barbados, B.W.I. ; Danzig, Morris William, South Africa ; Davie, Peter Cousin (B.Sc., New Zeal.), New Zealand ; Davies-Jones, Charles William Saunderson, Wales ; Dunlop, David, Ireland ; Fergusson, Mary Olivia, Scotland ; Galgut, Elijah Louis, South Africa ; Ghosh, Abani Mohan, India ; Gunn, Alexander William, Scotland ; Halley, Francis Murray, England ; Henderson, John Alexander, Scotland ; Hepburn, James, Scotland ; Hewat, Helen Gladstone, Scotland ; Hoashoo, Yit Hou, British Guiana ; Hume, Robert Marshall, Scotland (Pte., 9th Royal Scots) ; Israel, Elie Benjamin, South Africa ; Janakiramiah, Tanguturi, India ; Jarvis, Oswald Duke, Scotland (Lieut., R.A.M.C. (S.R.)) ; Johnston, George Graham Shaw, Scotland ; Jones, David Harris (M.A.), Scotland ; Kerr, Muriel Hamilton, Canada ; Kuny, Simon Alexander, South Africa ; Lam, Ping Wing, China ; Larché, Jean Etienne, Mauritius ; Laughton, Norman Blake, Scotland ; Laurie, Alan Rupert, England ; Law, Edward, Hong Kong ; Lawson, Robert, Scotland ; Lim, Albert Liat Juay, China ; Lim, Harold Liat Hin, China ; Little, Paul MacDonald, Scotland ; Loudon, John Graham, Scotland ; M'Cartney, James Elvins, England (Lieut., 5th Wores. Regt.) (1st class Hons.) ; M'Dougall, Helen, Scotland ; M'Dowall, Irvine, St. Vincent, B.W.I. ; M'Intyre, William Keverall, Tasmania ; Maenaughton, Marjory (B.Sc.), Scotland ; Malcolm, John Wright, Scotland (Lieut., R.A.M.C. (S.R.)) ; Malloch, Duncan, Scotland ; Martin, Mary, South Africa ; Meiring, Albertus Pieter, South Africa ; Meiring, Michael Ferreira, South Africa ; Menon, Ambat Ravunni, India ; Morton, Terence Charles St. Clessie, England (Prob. Surg. R.N.V.R.) ; Nixey, Frederick Henry, England ; Patterson, William Tyrrell, Scotland ; Potter, James Whiteford, Scotland (1st class Hons.) ; Price, Owen Douglas, Scotland ; Purdy, Wilfrid John, England ; Reis, Norman Louis, Scotland (Lieut., R.A.M.C. (S.R.)) ; Riddel, James Wilfrid George Hewat, England (Lieut., R.F.A.) (1st class Hons.) ; Riddoch, John William, Scotland ; Rodger, John, Scotland ; Russell, Cedric, England ; Shanks, William, Scotland ; Simpson, John Watson, Scotland ; Sinclair, George Hector, Scotland ; Solomon, Edward Thomas, South Africa (*in absentia*) ; Stewart, Samuel Henry, Ireland (2nd class Hons.) ; Stewart, Thomas Morton Johnston, Scotland ; Tren, Herman, South Africa ; Walker, James, Scotland ; Watthews, John Wilfred, England ; Werden, Lloyd Huntly (B.A. M'Master Univ., Toronto), Canada ; Weston, William Gordon, Australia ; Whitfield, John David, China ; Willecock, Maurice Exell, Scotland ; Wishart, James Matthew, Scotland (2nd class Hons.) ; Wright, Frederick Gordon, South Africa ; Young, Charles James, Scotland.

The Degree of Bachelor of Science in the Department of Public Health was conferred on Rutherford, Andrew, M.B., Ch.B.

The following awards of Fellowships, Scholarships, Prizes, etc., in the Faculty of Medicine were made :—

The Cameron Prize in Practical Therapeutics to Sir Lauder Brunton, Bart., M.D.(Edin.), LL.D., for his valuable researches in Pharmacology and their applications to Therapeutics, initiated in his M.D. Thesis on Digitalis, which was awarded a Gold Medal by the Senatus of this University in 1868, and continued and extended in the Second Edition of his work on the *Therapeutics of the Circulation*, published in 1914.

The Goodsir Memorial Fellowship to Stuart Bolton, M.D.

The Straits Settlements Gold Medal to Donald Cameron Macaskill, M.A., M.D.

The Ettles Scholarship to James Elvins M'Cartney, M.B., Ch.B. (Lieut., 5th Worcs. Regt.).

The Freeland Barbour Fellowship to John William Riddoch, M.B., Ch.B.

The Murchison Memorial Scholarship in Clinical Medicine to Charles George Lambie, M.B., Ch.B.

The Beany Prize in Anatomy and Surgery to James Whiteford Potter, M.B., Ch.B.

The Monat Scholarship in the Practice of Physic to James Elvins M'Cartney, M.B., Ch.B. (Lieut., 5th Worcs. Regt.).

The Conan Doyle Prize to Michael Ferreira Meiring, M.B., Ch.B.

The Buchanan Scholarship in Gynecology to William Alexander Cochrane, M.B., Ch.B.

The James Scott Scholarship in Midwifery to James Wilfrid George Hewat Riddell, M.B., Ch.B. (Lieut., R.F.A.).

The Dorothy Gilfillan Memorial Prize to Marjory Macnaughton, B.Sc., M.B., Ch.B.

The Wellcome Medals in the History of Medicine—Gold Medal to Robert Edward Burns. Silver Medal to Charles Simpson.

The Cunningham Memorial Medal in Anatomy to Henry James Parish.

The Whiteside Bruce Bursary to Duncan Ferguson Yuille.

TRIPLE QUALIFICATION PASSES.

The following candidates, having passed the *final examination*, have been admitted L.R.C.P.E., L.R.C.S.E., L.R.F.P.&S.G. :—James Leith Hendry, Aberdeen ; William Ainsley, Berwick-on-Tweed ; William David Bathgate, New Zealand ; James Bannerman, Elgin ; William Alfred Backenstoe, M.D., Pennsylvania ; Matthew M'Lintoch Bainbridge, Roxburghshire ; Alfred Cresswell Taylor, Seaton Sluice ; William James Forsyth Craig, Birmingham ; Harry Alexander Leonard Guthrie, Leith ; Percy Chisholm, New Zealand ; Charles Evelyn Meryon, Hampshire ; John Murray Hiddleston, Dumfries ; Arthur Macafee Burge, New South Wales.

ON THE TREATMENT OF TUBERCULOSIS BY
TUBERCULIN.*

By PROFESSOR DENYS
of Louvain.

I AM glad to have the honour to give you an address on the treatment of tuberculosis by tuberculin. For the last twenty years I have devoted myself much to that question, both from its experimental and clinical sides. In the book which I published in 1905† on this subject, I gave the results obtained in the case of more than 500 patients. Amongst these a great number were injected exclusively by myself, the rest by colleagues after being examined by me; in many cases this examination being repeated at intervals. Since the publication of my book I have continued to see many patients, as many as 300 to 400 a year. I give these figures only to show you that I have had opportunities of seeing a great number of cases of tuberculosis of all types and in all stages, and that the views which I now put before you are based on my own personal observations. I may add that many of my colleagues have written to me about difficult cases in their care, and that their communications have been of great assistance to me.

The specific treatment of tuberculosis is among the most controversial questions in medicine. I may safely say that in the opinion of a great number of doctors it is definitely condemned; but I think many of them, if not all, would recognise its incontestable efficacy if they gave the matter the careful consideration it deserves.

If specific treatment of tuberculosis is to be successful, three conditions are essential:—

- I. *An active tuberculin must be used.*
- II. *It must be used on a definite principle.*
- III. *It must be used in suitable cases.*

Let us examine these three points in order.

- I. An active tuberculin must be used.

I need not remind you that a great number of different tuberculins exist, all obtained from cultures of the bacillus of tuberculosis.

Amongst these, two, those of Koch, are very generally em-

* Read before the Medico-Chirurgical Society of Edinburgh, 5th May 1915.

† *Le bouillon filtré du bacille de la tuberculose dans le traitement de la tuberculose humaine*, 1905. Louvain: A. Uystpruyst, et Paris: Doin.

ployed. The first, known as Koch's old tuberculin, is obtained by concentrating a broth culture in a water-bath, and filtering the thick liquid thus obtained in order to eliminate the bodies of the bacilli; the second is the bacillary emulsion of Koch, which is prepared by pounding the bodies of the bacilli.

Since 1896 I have recommended a tuberculin to which I have given the name of Bouillon filtré, or, more familiarly, B.F. It is obtained by simple filtration of a culture on broth. This transparent liquid, passed through a porcelain filter, contains neither the bodies nor any part of the bacillus, but only the products of secretion.

Thus the B.F. has some resemblance to Koch's old tuberculin, but is distinguished from it by a characteristic which I consider as essential: it has not been concentrated in the water-bath, and therefore has escaped a long exposure to a temperature approaching boiling-point. Now we know that many micro-toxins are modified by temperatures approaching 100 degrees Centigrade, and even at 60 degrees; for instance, if, to vaccinate a horse against diphtheria, we used diphtheritic cultures concentrated in a water-bath, the anti-toxin we should produce would be valueless, because the heat would have reduced its toxic power. From this fact, and from other analogues, we may assume that a tuberculin which has not been exposed to heat is more active than one in which the natural properties have been destroyed.

Our B.F. differs still more from Koch's bacillary emulsion than from his old tuberculin, for whilst in the preparation of B.F. we retain only the secretions and eliminate the bacilli, in the preparation of B.E. we retain the bacilli and reject everything in the nature of secretion. When Koch recommended the use of his bacillary emulsion in the place of his old tuberculin, he did so in the belief that to produce strong immunisation against tuberculosis one must have recourse, not to the secretions, but to the substances forming the actual bodies of the microbe. The secretions, or genuine toxins or exotoxins, can only, according to Koch, produce immunity against themselves by the formation of antitoxin, but cannot act directly on the vitality of the microbe itself. In order to do this, one must inject a substance forming an integral part of the body of the microbe—in other words, an endotoxin. This theory, that it is necessary to have recourse to an endotoxin to check an infection, is evidently false. In order to recognise this, it is enough to remember that antidiphtheritic serum, a typical antitoxin, is obtained by injections of the secretions only of the bacillus of

diphtheria; nevertheless, by protecting the leucocytes from the action of the diphtheritic toxin, it enables them to fulfil their rôle as phagocytes and to cut off the disease. Consequently, it is not necessary to have recourse to endotoxins to procure immunisation capable of rendering the organism completely resistant to microbe infection. Toxin itself can give the same result. That this is true of tubercular infection is proved by experiments made in 1892 by one of my pupils, Dr. Broden. He injected in the peritoneal cavity of a number of dogs an emulsion of virulent bacilli of Koch; of these dogs he abandoned a certain number to their fate; to the rest he gave a series of injections of B.F. From time to time he examined an animal from each group, and observed in the former a progressive increase of the bacilli of tuberculosis eventually causing the death of the dogs that had not been already killed for observation during the first weeks. In the second group, those which had received tuberculin injections, the increase of the bacilli was arrested, and the tubercles, which at the beginning had attained a certain development, had become enclosed in fibrous tissue. The bacilli themselves had degenerated or disappeared.

The work of Dr. Broden, which appeared in *Archives de Médecine Experimentale* in January 1897, has perhaps not received all the attention that it deserves, for it illustrates the fact that, in the dog at least, B.F. has the property of arresting the development of tuberculosis.

For the last three years I have myself made a great number of experiments in immunisation on animals, more especially on guinea-pigs, in the belief that if tuberculin could increase the power of resistance of an animal so susceptible to tuberculosis as is the latter, it could be regarded as an even more powerful protection for bigger animals and for man. I chose as infecting agent a very virulent bovine bacillus, of which very few individuals, probably even a single one, would certainly have killed a guinea-pig. A short time before infection the guinea-pigs were given one or more injections of B.F. in doses of 1 to 20 c.c. The results varied according to the number of bacilli injected, but in all cases the animals which had been treated with B.F. showed an incontestable resistance. It was less marked, but nevertheless well pronounced, in the case of animals which had been injected by a thousand million lethal doses; in those cases injected with smaller doses, for example, with a dose a million times lethal, the difference between the guinea-pigs which had been treated by B.F. and those which had not was very striking. The latter presented

all the symptoms of advanced tuberculosis — local lesions and glands, swelling and induration of the liver and the spleen, great loss of weight, whereas the former at the same moment only showed slight local lesions, no lesions of the liver or the spleen, and no loss of weight. They nevertheless eventually succumbed to a slow and chronic tuberculosis, which in some cases lasted more than a year. Further, guinea-pigs which had been injected with very slight doses, one hundred times lethal, for example, resisted successfully and showed no signs of tuberculosis. In some experiments which I made this last summer with these slight doses, the guinea-pigs which had been treated with B.F. showed two months after the injections no lesions and no loss of weight, whereas those which had not been injected were all obviously tuberculous. Events put a stop to a further pursuit of these experiments. But, for reasons which we have no time to go into, I am certain that, given animals less sensitive than guinea-pigs to tuberculosis, we should obtain still better results. Dr. Broden's experiments on dogs, which have been already described, are evidence of this.

In the experiments on guinea-pigs of which I have just spoken, the B.F. was injected some time before the bacilli; its action was therefore preventive. At the same time I made some experiments in which the B.F. was injected after the bacilli and after the appearance of the first symptoms of tuberculosis. And these experiments have established that when a guinea-pig has been infected with a very mild dose of bacilli producing very slow tuberculosis, the B.F. causes an evident retardation in the evolution of the disease. This fact is interesting from the point of view of the treatment of tuberculosis.

At the same time as I made these experiments with the B.F. I injected other guinea-pigs with Koch's old tuberculin and with his B.E. on similar principles. The results were not encouraging. The old tuberculin affected the course of tuberculosis only in a very uncertain manner. The animals developed the disease practically as rapidly as those which had not been injected. With B.E. rather better results were obtained, but nevertheless none very pronounced. At any rate, both were incomparably inferior to results obtained with B.F.

In order to increase the resistance of guinea-pigs it is not necessary to have recourse to B.F.; we have obtained equally satisfactory results by injecting very attenuated bacilli incapable of producing the disease. Now, if we heat these attenuated bacilli for ten minutes to 70° Centigrade, we shall take away the

greater part of their power of vaccination. It is not therefore surprising that the B.E., which consists of fragments of dead bacilli in suspension, should have no very marked action.

We have not tested the large number of other tuberculins which exist in commerce, but for the most part they do not inspire much confidence, for one reason among others, that they have been subjected to manipulations, such as heating, precipitation, etc., which must have modified them more or less. Possibly an exception should be made in the case of the tuberculin of Béraneck, but it is nothing but our B.F., to which is added an extract of the bodies of the bacilli which, in our view, is of no value.

Before leaving this part of my subject, let me add that the products secreted by different types or varieties of tubercle bacilli are probably not absolutely identical; some races are perhaps better adapted for the purpose of treatment than others.

Let us resume. It is necessary to use a tuberculin possessing properties which will augment the power of resistance of the organism. Now the B.F. is undoubtedly of this nature. We will now proceed to examine our second point: How shall this tuberculin be used?

II. I believe I was the first to lay down the principle that, generally speaking, a treatment with tuberculin must be carried out in such a manner as to avoid all reaction.

The reactions produced by a moderate dose of tuberculin of whatever kind, B.F., B.A., or B.E., or any other, can be divided into three classes:—

1. Local inflammatory reaction at the point of injection, characterised by pain, swelling, and redness.

2. General reactions, fever, headache, fatigue, insomnia, decrease or loss of appetite; etc.

3. Local reaction, increase of the special symptoms of the disease, or appearance of new symptoms.

As I told you just now, if a treatment with tuberculin is to be given any chance of success, all such reactions must, in my opinion, be as far as possible avoided. Therefore it is of the first importance to begin with a very small dose. At the outset I began with a dilution of one hundredth, but under the pressure of my observations I was obliged to reduce the initial doses further and further, and to reduce them to a point of which I had never dreamt. In fact, I consider that in cases with no fever, for an initial dose, a 0.1 c.c. of a dilution of $\frac{1}{100000}$, contain-

ing therefore $\frac{1}{1000}$ of a milligramme of B.F., would be suitable. In cases with fever I recommend $\frac{1}{100000}$ of a milligramme, or even a $\frac{1}{1000000}$ of a milligramme.

That these doses are not without action is proved by reactions which, although slight, can be observed in the case of very sensitive patients. Among these reactions the most ordinary is a pain, not that produced by the injection or immediately after the injection, but one which begins rather later, perhaps some hours after, and may continue for one or more days. This pain is not caused by the slight traumatism of the injections, nor by the antiseptic added to the B.F.; it is a specific effect of the tuberculin, and it is the first slight symptom of reaction. Had the effect been more marked, the pain would have been accompanied with a slight swelling. Moreover, the patient may complain of fatigue and headache, and his temperature may rise by some tenths.

Assuming that a dose has caused no reaction at all, one would be justified in increasing it. But if symptoms of reaction appear the same dose should be repeated, or it should even be diminished, according to the intensity of the symptoms.

And I should here like to insist on the importance of slight reactions. How often have I observed that they do not receive the attention they deserve. I have seen many patients who had not improved as they hoped. Their doctors told me they had never observed any reaction, but, on making closer inquiries, I found, on the contrary, that they displayed frequent, if not regular reactions; for instance, the day after the injection they had pain; they very often had swelling at the point of one or more former injections. These swellings might not strike the observer at once, but become evident if a fold is made in the skin at the point of injection and compared with a similar fold made at the opposite corresponding point of the body. Perhaps the patient's temperature rises a few tenths; perhaps he is conscious of some slight discomfort. Very often he attributes no importance to these symptoms, and does not think it worth while to mention them to his doctor. It is therefore necessary to cross-examine him closely.

Let me now make a few general remarks on the treatment.

1. As I have said already, the injections should begin with no higher doses than $\cdot 000001$ gramme, or a $\frac{1}{1000}$ of a milligramme, in cases without fever, and with $\cdot 000000001$ in cases with fever.

In some afebrile forms of tuberculosis, which are often very

sensitive to B.F., as tubercular glands and cystitis, I should recommend even smaller doses; for instance, .00000001 or less.

In order to give these very small doses I use dilutions of which each is ten times weaker than that immediately preceding it. Thus the series of dilutions are—Pure B.F., B.F. to the tenth, hundredth, thousandth, etc., ending with a 1000 millionth. Thus to give a treatment such as I have described, you must begin, in cases without fever, with an injection of 0.1 of the dilution at a millionth, and in cases with fever, with an injection of 0.1 of the dilution at a thousand millionth.

2. If the injection causes no reaction, two ways of proceeding further are open to you as long as you are working with small doses. You can advance the dose by tenths of a c.c.—0.1, 0.2, 0.3, 0.4, etc., or by fourths of a c.c.—0.25, 0.5, 0.75, 1 c.c. You can adopt the first course in cases of sensitive patients, the second in the case of patients who adapt themselves easily to B.F. The latter are generally patients with slight lesions and without fever. Nevertheless, I should recommend that in febrile cases the progression by fourths of a cubic centigramme should be abandoned when the dose amounts to .0001 (a di-milligramme), perhaps even to .00001 (a centimilligramme); in febrile cases when the dose amounts to .00001, or a centimilligramme, or even a tenth of a centimilligramme.

I have often tried treatments with rapidly increasing doses by fourths, even up to a milligramme, but I was obliged to recognise that had I advanced less quickly I should have attained high doses with less inconvenience to the patient, and with less interruptions owing to reactions.

3. As I already said, where there is any, even the slightest reaction, I should repeat the dose or give one even smaller, and if I should make any exception to this rule, it would be in the case of the reaction taking the form of a slight tenderness at the spot of injection, and that only for a few hours.

4. In the first period of the cure two injections may be made a week; later, when the dose has arrived at a milligramme, one may be sufficient.

5. When some improvement is observable in the patient, it is very often useful to repeat the same dose several times, even if it produces no reaction. In spite of this interruption in the progress of the treatment, improvement will continue, and his tolerance of B.F. will at the same time increase.

6. In the early stages of the treatment the patient often

exhibits great sensitiveness to B.F.; he may pass through a critical period, during which much prudence is necessary. This period may last some weeks, after which the patient takes the injections easily.

The length of the treatment depends on the gravity of the case. When the symptoms are ill defined it should last 4 to 6 months. In these cases the patients generally accustom themselves easily to B.F., and the dose of 1 milligramme, or even 5, can be obtained in that period.

In better defined cases—for instance, pulmonary tuberculosis with bacilli in the sputum, glands, tubercular joints—the treatment should continue at least for 6 to 12 months, and in many cases even longer. It depends mostly on the extent of the lesions—the more extensive the lesions the longer the treatment. For patients with severe lesions in the lungs, treatments lasting for 1, 2, or even 3 years are in my opinion advisable, especially if they continue to have bacilli in the sputum, and are therefore liable to reinfection after the diminution of their vaccinations.

The vaccination against tuberculosis, like other vaccinations, is temporary in its effect. On the other hand, we should not forget a biological peculiarity of the bacillus—its enormous resistance to the destructive power of the body towards the microbes in general. I mean phagocytosis and bacteriolysis. While the great majority of microbes are destroyed in a few hours, some even in a few minutes, by one of these two processes, the bacillus of Koch remains unchanged for weeks, even if the bacilli injected are deprived of all pathogenic powers—that is to say, are absolutely avirulent.

We should recall here also the experiments of a French bacteriologist, Vallée, who repeated the experiments of Behring on the vaccination of cattle against tuberculosis. The vaccinated animals resisted successfully a lethal injection of virulent bacilli, but some of them died one or two years after from acute tuberculosis, often from meningitis. After inquiry, it was found that the fatal issue was due to the virulent bacilli, injected for test, and which had retained their vital properties in the animals. It was even possible to localise the bacilli in the lymphatic glands. The glands were normal in appearance, but injected into guinea-pigs developed tuberculosis. Thus, even in vaccinated cattle some bacilli can resist the destructive processes of the body, and may develop later on. In my opinion the same must be admitted of patients treated with B.F.

In view of this extraordinary resistance of tubercle bacilli, I attribute great importance to second precautionary treatments, repeated after a first treatment; a second, or even a third, should be given. They are generally taken easily, as the body becomes accustomed to receive tuberculin. The doses can be increased rapidly, beginning with $\cdot 00001$ gr. (a hundredth of a milligramme), or $\cdot 0001$ gr. (a tenth), and can be increased to $\cdot 01$ gr. or more. In favourable cases the treatment may be finished in two months with the dose of $\cdot 01$ gr. In the second precautionary treatment the dose of $0\cdot 1$ gr. and more can be given without the least inconvenience to the patient.

Between the first and the subsequent treatments the interval may vary from 4 to 12 months.

Patients who have not received a second treatment are liable to relapse. When they come for consultation in an early stage of that relapse, it is often remarkable how quickly they respond to a new treatment. If they refuse to undergo fresh injections, the disease increases in proportion as the effect of the formerly acquired immunisation passes off. In cases of tuberculosis of one lung, during the relapse it is the rule to find the disease appearing and gaining ground in the lung not originally affected, whereas the former is very little touched by the new injection.

From what I have said you will see clearly how far my method is removed from that which I often see in use. In many cases I have noticed that the initial dose of B.F. is one-half or even one milligramme for patients with no fever—that is to say, five hundred or a thousand times stronger than my own initial dose. Further, patients show regular reactions, amounting to 101° to 102° and more, and that sometimes twice a week. Although I would not say that a reaction, even pronounced, occurring from time to time is altogether bad, I am convinced that frequent reactions must lead in the end to results the opposite of those desired; not only the patient loses his power of resistance, but he becomes devaccinated and the disease makes progress.

I have observed this fact so often that I have no longer any doubt about it.

To resume. This is the principle on which I work: to give B.F. in such a manner as to produce no disturbance in the organism. With this object, to start with an infinitesimal dose and to regulate its increase strictly in accordance with the tolerance of the patient.

III. We now arrive at the third point. Given an active tuber-

culin employed on the above principle, what results may we hope to obtain?

Let us put on one side a certain number of cases, in which it is impossible to hope for improvement. Such are general military tuberculosis, rapid pulmonary tuberculosis, chronic tuberculosis in the last stages, tubercular meningitis, etc. All these are forms which rapidly prove fatal and before which B.F. is powerless, as there is insufficient time for it to produce a necessary immunisation. To these acute and rapid types of disease one must add lupus, which although distinguished by its chronic character does not give satisfactory results, for reasons as yet unknown.

Fortunately other forms of tuberculosis are much more common than the above.

Foremost among these I will consider those ordinary cases of latent tuberculosis having no very definite signs beyond anæmia, loss of weight, want of appetite, malnutrition, want of energy. Other symptoms are sometimes present, such as a cough or some local sign, not necessarily very characteristic. The patients are often members of a tuberculous family, or have lived in the same house with consumptives. On examination, it often proves that at some former time they have had glands, pleurisy, hæmoptysis, or other slight symptoms of the disease. To such patients the name of pre-tuberculous has been given as subjects predisposed to contract the disease, whereas in reality they are already infected with a mild form. To this category we must add a form very frequent in children, in whom malnutrition and arrested development are the chief symptoms. In all these cases we may count on an almost certain cure; the patient will regain good, if not perfect health. This result can be obtained by a treatment with B.F. alone, without any alteration in the habits of the patient.

In cases in which the localisations and the lesions are better defined, the results obtained by treatment are, generally speaking, more satisfactory in slight and slow cases than in those in which they are important and acute.

To give you an idea as precise as possible of the effect of B.F. in the case of definite tuberculosis, I will take some statistics with reference to the pulmonary localisation from the book on B.F. which I published in 1905. These statistics include all the cases of pulmonary tuberculosis among my private patients, all of whom I have treated myself or have seen at least once between April 1899 and May 1904—that is to say, in five years. The evidence of these statistics seems to me to be conclusive, since they do not

refer to selected cases but to all those I have examined during that period. Since 1905 I have continued to collect a large material to bring my statistics up to date, but though I have not had leisure to classify them, it is evident already that my former conclusions are borne out in every respect.

The list includes 926 patients suffering from all forms in all stages of pulmonary tuberculosis and all having this in common—the presence of the bacilli of Koch in the sputum.

TYPES.	C	OC	FA	A	S	R	M
I	●●●●●●●●●●	●●	●●	●	●	●	●●
II	●●●●●●●●●●	●●	●●	●	●	●	●●
III	●●●●●●●●●●	●●	●●	●	●	●	●●
IV	●●●●●●●●●●	●●	●●	●	●	●	●●
V	●●●●●●●●●●	●●	●●	●	●	●	●●
VI	●●●●●●●●●●	●●	●●	●	●	●	●●
Lesions	●●●●●●●●●●	●●	●●	●	●	●	●●
Lux-pourmons	●●●●●●●●●●	●●	●●	●	●	●	●●
VI	●●●●●●●●●●	●●	●●	●	●	●	●●

From these 926 patients, we will deduct 484 for the following reasons:—

In 120 cases we were unable to obtain any information at the moment these figures were compiled; 101 received no injections at all; 75, also desperate cases, received injections in ineffective doses, only in the way of encouragement; 42 did not persevere sufficiently long with the treatment; 92 were injected not in accordance with the rules laid down; 54 patients refused the treatment.

We will now consider the remaining 442 patients. The results obtained in these cases are grouped in this table, which combines the extension of the lesions with the temperature of the patients when they came for consultation. In order to understand it, some explanation is necessary.

The first column gives the outlines of the human chest, front

and back, to show roughly the extent of the principal lesions, judged by very definite signs—that is to say, by the dulness and the presence of moist râles. The extent is indicated on the table in black, and according to its size we may distinguish six types. In the first there is no evident loss of sonority, no râles, although bacilli are present in the sputum. In the second type the above-mentioned lesions do not extend beneath the clavicular and beyond the subscapular region. In the third and fourth they descend lower and lower; in the fifth, covering a whole lung; in the sixth, parts of both lungs, generally one lung being much more affected than the other.

In the other column are signs of dots, squares, lozenges, stars, each sign corresponding to a patient.

These signs are grouped in horizontal lines according to the extent of the lesion. In the top line are grouped the cases which on examination showed no evident lesions; in the bottom line, the cases with both lungs attacked, and between the two the cases are arranged in order of the extent of the lesions.

The dots represent patients without fever when they first came for consultation; the squares, patients with fever, who lost it in less than fifteen days; the lozenges, patients who lost this fever after fifteen days; the stars, those whose temperature continued high.

The signs which have their centre white are those patients whose condition was already hopeless when they first came for consultation.

In the first vertical column (C) we place the patients whom I considered as cured of tuberculosis, and by cured I understand primarily the arrest of the infection, and therefore of lesions, and the production in the organism of a state of resistance to further spread of the bacilli of tuberculosis. These patients had ceased to expectorate, or, if they did so, the expectoration was without bacilli. In the first type, and in the greater number of the second and third types, this stage of cure synchronises with the disappearance of all pathological symptoms, but in those in whom the lesions had acquired a considerable extension, as in the types V. and VI., after treatment, some after-results of the disease remain; for instance, some cough and expectoration, some diminution of the power for work, difficulty of respiration in running or climbing. The dulness on the chest does not disappear; in fact, it becomes rather more marked by the increase of sclerosis. Râles in the lungs generally disappear entirely.

In the second column (Q.C.) I put the patients under the heading Quasi-cured. They are, roughly speaking, in the same condition as those in the first column, but they still have bacilli in the sputum, although the amount of sputum is sensibly decreased. When I first began work on this subject I attached the greatest importance to the disappearance of the bacilli, but when I observed that a great number of patients in whose expectoration bacilli were present nevertheless enjoyed sufficient good health, and after several years showed no signs of fresh lesions, I was led to compare them to germ-carriers in other illnesses, just as an otherwise healthy man having germs of typhoid in the intestine cannot be described as suffering from typhoid fever, so I think one cannot describe these patients, quasi-cured, as suffering from tuberculosis. Generally, then, bacilli eventually disappear, and I have myself known them disappear at the end of 5, 6, and 8 years.

In the third column (F.A.) I have grouped cases greatly improved; in the fourth (A.), cases improved; in the fifth (S.), stationary; in the sixth (R.), cases going back; in the seventh (M.), those who have died.

An interesting fact is the accumulation of signs at the top of the column of cures and at the bottom of the column of deaths. It shows in a very striking manner the influence of the extent of lesions on the results.

You will also see that the stars, which represent patients whose temperature remains high, are found for the most part in the column of deaths.

The following table gives you the same facts but in figures:—

Types.	C.	Q.C.	G.I.	I.	S.	B.	D.
I.	33	7	4	1	2	2	4
II.	56	12	10	5	4	2	9
III.	53	18	11	6	4	3	16
IV.	14	6	3	6	1	...	11
V.	19	8	4	6	3	2	38
VI.	18	5	4	5	5	...	22
Total	193	56	36	29	19	9	100

Out of 442 cases, 193, that is, 43 per cent., are in the column classed as cured. In 1905, that is to say, at the time of the publication of my statistics, in many patients—the patients of

1899, 1900, and 1901, for instance—the cure had lasted already several years.

Fifty-six patients, that is, 20 per cent., are in the column of quasi-cured.

Out of 442 cases, 193, that is, 43 per cent., are in the column classed as cured, and 56, that is, 13 per cent., are in the column of the quasi-cured.

If we add these two figures together we obtain 56 per cent. of arrested tuberculosis; finally the four first columns give us 71 per cent. of successes, more or less complete. If we subtract the 49 patients who were too advanced to be treated with any hope of recovery, the figure of successes rises to 80 per cent.

The types I., II., and IV. furnished the greater number of cures—142 out of 193—that is, 73·5 per cent.

In regard to influence of fever, the patients whose temperature was normal when they first came for consultation represent 60·4 per cent. in the proportion of cures, those in whom the temperature has taken more than fifteen days to drop after rest, only 38·1 per cent.

Amongst these 442 patients only 5 did their cure of B.F. in a sanatorium; of the others a certain number passed some time in the country; the rest continued to live in their own homes. Some gave themselves complete or comparative rest; others continued their occupations.

I have no time to go into the other tuberculous localisations, but B.F. gave also in these cases very satisfactory results. Let me mention among others peritonitis, tuberculosis of the cæcum, pleurisy, cystitis, tuberculosis of the bones, joints, glands; the results can be found in my book. In my opinion, except in urgent cases, surgery should not intervene until a cure with tuberculin has been tried.

The results after such preliminary B.F. treatment are more complete, and eliminate almost always the danger of infection of the wound and the surroundings, so frequent in cases of operations which have not been injected, and also relapses in other parts of the body.

I cannot hope to convince all of those among you who may be opposed to the use of specific treatment, of the efficacy of the B.F., but I should be happy if my communication, necessarily brief and therefore incomplete in many points, may persuade some of you to try B.F. in the manner I have indicated above. On one hand, I can assure you that it will do no harm to the patients, and

on the other, I hope that you will arrive at the conclusion that this product is a valuable specific. It is not, of course, a panacea, but I think that at the present moment it is the most efficacious of treatments. I hope that your personal experience will lead you to the same conclusion.

ON THE USE OF SCOPOLAMINE MORPHINE IN LABOUR.

By SIR J. HALLIDAY CROOM,

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PAINLESS labour is no novelty in Scotland. Since the earliest days of chloroform such a condition has been possible in the hands of any surgeon of skill and patience, and attainable by any woman who desires to avail herself of it. Chloroform has ever been the anæsthetic of choice in obstetrics. Its safety and universal suitability in all cases, except, perhaps, in eclampsia, is universally recognised. In all obstetrical manipulations and operations chloroform, as an anæsthetic, has no equal. Its exceptional safety in obstetrics is due to the method of its administration, and probably also to the condition of the heart.

Whatever may be the differences of opinion as to its safety and general applicability in gynecological and general surgery, there is no question about its value in obstetrics. In general surgery it is accompanied by various trying, embarrassing, and sometimes dangerous symptoms, and it was with a view to prevent and minimise these conditions that the combination of scopolamine and morphine was originally introduced. I have only once, in my whole gynecological experience, whether in minor or major operations, met with a fatal accident due to chloroform. In that case the accident occurred before the actual operation was attempted, and might almost have been discounted, as the ovariectomy was complicated by advanced exophthalmic goitre.

Schneiderlin was originally led by his observations on the effects of scopolamine on the insane to use a combination of scopolamine and morphine for the purpose of reducing to a minimum the amount of chloroform required for an anæsthesia. The results were so satisfactory that he experimented further and found that scopolamine morphine was sufficient in some cases for light anæsthesia.

The use of this combination of drugs in surgical cases is now well recognised. It minimises the amount of chloroform used; it lessens nausea and emesis; the stage of excitement is shortened; the fear of anaesthesia is largely diminished; there is a decreased salivation with a diminution of the risk of pneumonia; and there is continued sleep, which avoids the pain commonly following operations with chloroform and ether.

But there are disadvantages in the use of these drugs before chloroform anaesthesia. They sometimes fail to produce the desired effect. They are also said to act injuriously on the respiration. Upon this point we know that there are idiosyncrasies in the administration of morphia, and we know that scopolamine, in large doses, paralyses the respiration. Further, it is a fact beyond dispute that scopolamine morphine may cause death from paralysis of the respiration, against which artificial respiration is quite ineffective.

Many deaths have been recorded where scopolamine and morphine have been used before the administration of chloroform, but whether these drugs were the cause of the deaths or not seems to be somewhat of an open question. In any case, when morphine and scopolamine are once injected before the administration of chloroform, they are wholly beyond control, and if there is one thing more certain than another, it is that every additional narcotic certainly complicates an anaesthesia.

The pharmacological action of these drugs has been discussed very fully in a paper by Hatcher, and he has shown that their antagonism is more apparent than real—that in fact it is to a great extent imaginary. There can be no question now that while for some time scopolamine and hyoscine were not identical, at least in physiological action, the chemist and pharmacologist agree that scopolamine and hyoscine are practically the same. As a matter of fact, recent laboratory researches have made it appear that in scopolamine morphine we have not, as was formerly believed, two independent substances acting in combination, but a new combination which acts in a completely different way from its individual components. Dr. Ribemont-Dessaigne at the Hôpital Beaujon seemed to get interesting results by a new preparation of morphia prepared by Paulin. It is obtained by subjecting the hydrochlorate to the action of fermenting beer-yeast. This has been described as morphine *désintoxiquée*. Narcophine (which is a double meconate of narcotine) has been used with scopolamine. Personally, I have always employed

scopolamine morphine and found the combination quite satisfactory. My experience is confined to this alone.

It is, however, with the use of scopolamine morphine in labour that I am here concerned.

It was in 1903 that von Steinbüchel first made some experiments in childbirth with the combination of scopolamine (or hyoscine) and morphine. In 1905, Karl Gauss, of the Freiburg Frauenklinik, set himself to study the subject of scopolamine morphine under the supervision of Krönig, and developed what for the last nine years has been known on the Continent as *Dämmer Schlaf* or the Gauss Twilight Sleep. His first article appeared in 1906 and contains a report of 500 labours. Naturally this communication created a great interest both in America and here. In 1907 he published a second article reviewing 1000 cases, and in the spring of this year he published an extended study covering 5000 cases. By slightly increasing von Steinbüchel's dose Gauss found that the patient remained in a state of clouded, but not obliterated, consciousness, and it was he who first observed the extraordinary affection of the memory. Events which had occurred before the patient had entered this state of clouded consciousness were perfectly recalled, while all impressions received while in this condition were entirely forgotten. To express this peculiar state, which more closely resembled a waking than a sleeping one, Gauss coined the word "*Dämmer Schlaf*"—Twilight Sleep.

Since then an enormous literature has gathered round the subject, not only in the medical but in the lay press. The literature is mainly confined to Germany and America, and to a limited extent to Great Britain. In Scotland, Dr. Buist of Dundee has studied and written fully on the subject.

I employed this method first of all in 1908, and the results I then obtained were published in a short paper in the *Journal of Obstetrics and Gynaecology of the British Empire*. For the last eight years I have used it to a large extent in hospital practice, and uniformly in all my private work, and generally with most gratifying results.

My object in this communication is to record my experience of this combination of drugs generally, without burdening the paper with tables and records of individual cases. In my communication of 1908 I gave a series of cases in detail, and my resident, Dr. Ruthven Laurence, afterwards published another list of my cases.

Gauss, in his original paper, says the object to be attained by the use of scopolamine morphine in obstetrics is, in fact, nothing more than a reduction of suffering and that slight degree of clouding of the consciousness in which impressions are not apperceived by the patient.

The patient may be said "to perceive pains but not to apperceive pains." Two results are therefore obtained—first, amnesia, which was the original purpose aimed at; and also, in most cases, a certain amount of analgesia.

Its administration, however, in obstetrics is different from that employed in surgery; first of all, because a woman in childbirth is much more susceptible to narcosis, so that a very small dose will be sufficient to produce the effect; in the second place, deep narcosis is not to be desired—on the contrary it must be so limited that the muscles which play the most important part in the work of birth shall retain their effectiveness both voluntarily and involuntarily. Indeed when the narcosis produced is so deep that the contractions are painless, then the patient unquestionably is overdosed.

The condition has been well described as similar to that of a person who is suddenly roused from sleep in the middle of the night and asked a few questions. Although answering these questions at the moment, the sleeper will often not remember the occurrence at all the next morning.

The advantages claimed thus for the use of scopolamine and morphine in childbirth are mainly two:—

First, the loss of memory. In all cases where an extended and fair trial has been made of these drugs, and where the cases have been properly conducted, it has been found that the woman seldom retains any memory of labour and its sufferings.

One cannot help realising that in the present state of our civilisation, and in our modern conditions of life, childbearing has ceased largely to be a physiological process, and probably the sufferings of women have considerably increased. So much is this the case, that the dread of the pain of childbirth has become a very serious menace to the birth-rate, and a large number of voluntary sterilities are the result of this overwhelming fear. The abolition of the memory of the event has a very material effect in reducing this painful anticipation.

Every case, however, is not by any means a success. In some cases the amnesia is complete and entire, in others it is imperfect, and in some a total failure, depending a great deal upon the care

with which the drug is employed, a good deal upon the constitution of the patient, and a very great deal on her surroundings.

Secondly, with regard to the analgesia, there can be no doubt, although opinions are somewhat conflicting on this point, that there is, in many cases, entire absence of pain, though more frequently the pain is only lessened. In every case the suffering is materially modified. It is therefore through abolished memory and lessened pain that scopolamine morphine succeeds in bringing about "painless labour."

By many authorities it has been alleged that post-partum hæmorrhage is diminished. So far as my personal experience is concerned, I have not found this to be the case. I have had no serious case of post-partum hæmorrhage except at the beginning of my series of cases, because since then I have always used pituitrin at the end of labour, and it is rather to the pituitrin than to the scopolamine morphine that I attribute the freedom from post-partum hæmorrhage.

It must be clearly understood that inertia of the uterus is one of the distinct contra-indications for scopolamine morphine, and this treatment must never be undertaken unless the uterus is definitely active.

Such being the aim of these drugs, the questions now are, How is it to be attained? What are the necessary adjuncts?

First of all, I have been quite content with the use of scopolamine and morphine in the proportion of $\frac{1}{200}$ grain of scopolamine and $\frac{1}{8}$ grain of morphine, as prepared by Burroughs Wellcome. A hypodermic injection is given best at the beginning of the second stage of labour, at all events when labour is very active. The injection is given intramuscularly, and best into the glutei muscles. If given sooner, it is apt to bring about a cessation of pain. This is repeated at intervals until amnesia is more or less complete. It should not be given later than $1\frac{1}{2}$ to 2 hours before the cessation of labour, as it may have a prejudicial effect upon the child.

Three-quarters of an hour or thereabout after the first injection the patient can be shown some object, say a watch, and then 30 minutes later the same object. If at this time the patient remembers having seen the object before, a second injection is given. If, however, at the first time the amnesia is present, the second dose need not be given. The third and succeeding doses may be followed at intervals of two hours according to the condition of the patient. Without these

memory tests the drug is apt to be given too freely, and although, so far as I know, no untoward results are recorded, at the same time the use of the drugs must be carefully controlled.

I have not myself systematically employed these memory tests, because I have found that one can rely upon the co-ordination, reflexes, and the general impression of the patient. Still, for the accurate administration of the drug and the regulation of the doses, these tests are of much value.

Any routine method such as Siegel suggests, of administering the drug without any tests of any kind, so as to simplify its technique, is unsatisfactory, because every case must be dealt with on its own merits, and what might be too much for one might be too little for another. Therefore in the method of administration one must be guided by the effects on each individual patient.

Although valuable both in primiparous and multiparous women, it is obviously administered with greater advantage in primiparæ, owing to the relative length of the second stage of labour. A nervous primipara is, perhaps, the case in which the effects are most striking.

It is obvious that the presence of the physician in the house during the second stage of labour is essential, in order that the proper tests and observations may be made from time to time, and the amount of the drug carefully regulated. This I do not regard as any tax on him, because the physician's presence in the house is practically a necessity during the second stage of labour in any case. It is a treatment that should never be left to a nurse alone, because the accurate giving or withholding is of vital importance. I can readily understand that awkward consequences might arise if patients were given a dose and then left alone. The safety of the method, in my opinion, is just in proportion to the care with which it is administered.

In order to obtain the full effects of these drugs, and to produce the condition known as Twilight Sleep, certain surroundings are very helpful. These are, a darkened room, perfect quiet, and the personal influence of a good nurse. Hence it is that I have found throughout the whole of my experience during these eight years that the condition is much more satisfactorily induced in private than in hospital work. The noise of a delivery room, with perhaps another labour going on at the same time, the movement of the nurses, and the glare of either natural or artificial light are not by any means conducive to the full effect of this treatment. I have always noticed that patients are very

susceptible to sudden noise or light. Gauss calls this sudden awakening "an isle of memory." Such a moment of wakefulness may destroy the amnesia for a time and render the case incomplete.

It is, in my opinion, absolutely wrong to push the narcosis so far as to render the patient fit for any operation, even low forceps. Operations, whatever their nature may be, ought to be performed under the influence of chloroform. As a matter of routine I always give a little chloroform when the perineum is being stretched. Under the circumstances very little is necessary. A whiff of chloroform so administered at the end of labour completes the labour satisfactorily.

A considerable difference of opinion seems to exist as to whether the labour is prolonged by the use of this narcosis. So far as my experience has gone, the second stage is prolonged, but as the patient is not suffering, a little prolongation makes no difference, and renders the use of forceps less necessary as a time-saver.

Though there are obvious contra-indications and disadvantages in the use of these drugs in general surgery, such as their action on the respiration and circulation, their failure to produce the desired effect, their varying action in various persons, and the fatalities that have been associated with them, yet these disadvantages do not obtain to the same extent in obstetrics. The use of these drugs in obstetrics, however, must be avoided where there is any general affection of the respiratory organs, and also where there is an existing inertia of the uterus, anemia, debility, and especially where there are histories of short labours and intercurrent disease. On the other hand, in heart affections scopolamine seems to have a good effect. During childbirth it is beyond question that shock and fear react upon women with cardiac disease very detrimentally. The presence of heart disease, therefore, is rather an indication than a contra-indication for the use of this method.

It is almost needless to say that these drugs act differently on different women, and that occasionally they fail to have the desired effect at all. Further, some women become excited, flushed, and talkative, which is sometimes embarrassing. But beyond these symptoms, so far as my own experience is concerned, I have not met with any complication worth recording.

There is nothing more remarkable than the condition of the patient post-partum. If she be allowed to sleep for two or three

hours—which she does if she is undisturbed—at the end she wakens in a condition of well being which is quite striking. She is unconscious of anything that has occurred, and in some cases is surprised to be told that the labour is over. There is never any appearance of fatigue or nerve exhaustion. This has been my uniform experience.

Of course the natural question that arises is, Is it dangerous? I will answer that at once. During these 8 years I have never seen an untoward accident of any kind either to the mother or child. This combination of drugs has now been administered in many thousands of cases, and the evidence of these testifies that in not more than 0·5 per cent. have deaths occurred, which is less than the ordinary labour records. From one source and another, about 8000 cases have been reported from Germany alone, and a very large number from America, and the results, in the main, have been excellent both for the mother and child.

The success of scopolamine morphine during labour has led many to attempt its use, and many of these attempts have been unsuccessful, and may be attributed to the unsatisfactory nature of the preparation employed, the excessive use of morphine, an attempt to produce absolute painlessness—which, as I have already said, is a distinct indication of overdosing—and perhaps the adoption of an imperfect technique.

With regard to the condition of the children, the administration of these drugs distinctly affects them.

They are often born in a state of oligopnea. This is not a matter for surprise when regard is had to the ease with which young children are affected by morphia. That scopolamine and morphine pass across the placental circulation and appear in the urine of the new-born child is beyond question. The barrier action of the placenta, however, is no doubt of considerable value, because the percentage of the drug found in the urine is quite infinitesimal. But it is a still more important fact, so far as the child is concerned, that traces of morphine are excreted into the colostrum, or milk, and these traces are sufficient to cause intoxication of the new-born.

It is a cardinal principle to avoid the administration of narcotics, especially morphia, to infants, and it is impossible but to conclude that the administration of these drugs to the mother must affect the infant in a proportionate extent. I have already said that it is of the utmost importance that the parturient should be always under the watchful eye of the physician, and

this is in the interests of the child as well. If it is impossible to know which individual patient will be more easily affected by the drug, it is equally difficult to judge for the child.

The condition of the child is not asphyxia, but simply drowsiness induced by the morphia (scopolamine morphine should not be administered later than two hours before birth); or it may probably be due, as Gauss points out, to the scopolamine exerting an influence on the respiratory centre, so that the child requires a greater quantity of carbonic acid in its blood to stimulate the respiratory centre.

This condition of the child is sometimes alarming to those who are not accustomed to see it, but in my experience, as in most others, it is not serious. Personally, I have not met with a single fatal case.

So much is this the case that Gauss, Siegel, and others do not even attempt to resuscitate the child, but leave it alone. The mortality of the children, even supposing one credits every still-born child directly to scopolamine morphine, is only 2.15 per cent.

To sum up:—

No absolute routine treatment should be adopted.

Every case should be treated upon its own requirements.

The physician must be in constant attendance from the first dose, which should be administered when the pains become regular early in the second stage of labour.

The patient should be kept as quiet as possible.

The quieter the surroundings, the more successful the result.

It is important that the preparation should be fresh, and accurately prepared.

Fœtal heart sounds should be carefully watched.

Artificial delivery, when necessary, should be accomplished under chloroform.

Oligopnea should be carefully watched for and treated when present.

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ON THE TREATMENT OF EXOPHTHALMIC GOITRE,
ESPECIALLY IN RELATION TO THE CONTROL OF
PROTEIN METABOLISM.*

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ALL are not yet agreed as to the underlying pathology of exophthalmic goitre or Graves' disease. It may be that it is a primary disease of the thyroid, or that the changes in the thyroid gland, which are those of an organ in active evolution, are secondary to a diminished controlling influence of the parathyroids, as has been suggested, or to a lesion of the nervous system. A most important contribution to the rôle of the nervous system was made by the late Dr. Alexander Bruce, who demonstrated the occurrence of capillary hæmorrhages in the 2nd and 3rd thoracic segments of the cord with degeneration of the cells of the intermedio-lateral tract of these segments. Langley has shown that dilatation of the pupil, protrusion of the eyeball, and acceleration of the heart follow stimulation of the sympathetic roots of these segments. Whatever view may ultimately be established as to the underlying pathology, there seems to be little doubt that the phenomena are those of hyperthyroidism, and that this hyperthyroidism has a profound effect upon the protein and the carbohydrate metabolism. In severe cases of Graves' disease there is pronounced emaciation, there is great increase in oxygen consumption, and a profound increase in protein metabolism. This increase in protein metabolism, with emaciation, is best seen in acute cases or in exacerbations occurring in the course of chronic cases; but in every case of Graves' disease, where the condition is at all pronounced, emaciation is one of the factors with which the physician has to deal, and it seemed worth while to examine some of the methods of treatment at present in use and their influence on protein metabolism. In the address in Medicine to the British Medical Association, 1912, the late Dr. George A. Gibson strongly advocated the use of suprarenal extract in the treatment of Graves' disease, and stated that in it we had an agent which could fearlessly claim to have no rival. That it does produce benefit in certain cases there can be no doubt; under its use the pulse

* The chemical analyses in this paper were carried out in the Laboratory of the Royal College of Physicians, Edinburgh, under a grant in aid of research by the Carnegie Trust.

frequency diminishes, exophthalmos becomes less pronounced, the thyroid swelling diminishes, and the patient gains in weight.

The following illustrative cases are offered as examples of a number of cases of Graves' disease in which a record has been kept of the metabolic changes under treatment:—

CASE I.—A female patient, *æt.* 40, married, was admitted to the Royal Infirmary, 12th July 1912, complaining of pain over the heart, palpitation, and a sensation of choking. In the summer of 1904 the patient became somewhat suddenly ill with palpitation and faintness. She was confined to bed and felt very nervous. After a month in bed she improved somewhat and was able to undertake her home duties, but at irregular intervals the symptoms recurred. For eight years there had been numerous attacks of palpitation, faintness and dimness of vision. In December 1911 prominence of the eyes was first noticed, and was followed by a choking sensation in the throat. Patient's family and personal history had been uneventful and her social conditions favourable.

On examination she was seen to be a somewhat poorly developed, emaciated female, nervous in appearance and manner. The thyroid was considerably enlarged. Exophthalmos marked on the right side, less marked on the left. There was a fine tremor present in the extremities and eyelids. There was complaint of pain in the precordial region, palpitation, faintness, and dyspnoea. The heart was dilated, and on auscultation a systolic murmur was audible at the mitral and tricuspid areas. The pulse frequency when at rest in bed varied between 80 and 90 per minute, but there were frequent attacks of palpitation, during which there was marked tachycardia. With the exception of some exaggeration of the reflexes examination of the other systems showed no abnormality. On 28th July the patient was placed upon a fixed diet, her weight then being 7 st. 13 lbs. During the time patient was on the fixed diet and at rest in bed there was a very slight gain in weight—3 lbs. between 28th July and 25th August inclusive. During the period 7th August to 25th August inclusive the nitrogenous excretion by the urine was estimated. The results are given in Table I. The observation is divided into three periods—A, B, and C. During period B a daily intravenous injection of 10 m adrenalin chloride solution (1:1000), diluted with normal saline, was administered. The administration was followed by a good deal of palpitation and nervous disturbance. No glycosuria resulted.

Examination of Table I. shows that during the course of the observation there was a very slight and gradual increase in weight and a very slight diminution in the total nitrogenous excretion, but this was progressive during the whole time the patient was

TABLE I.
CASE I.—ANALYSIS OF URINE FROM 7TH TO 25TH AUGUST 1912.
Adrenalin.

Date.	Specific Gravity.	Amount in c.cm.	Total Nitrogen.	Urea Nitrogen.	Ammonia Nitrogen.	Kreatinin Nitrogen.	Uric Acid Nitrogen.
August 1912.							
7th	1016	850	7.874 per diem.	6.708 per diem.	0.509 per diem.	0.170 per diem.	0.070 per diem.
8th	1013	1210	9.075 "	7.754 "	0.654 "	0.280 "	0.092 "
9th	1018	880	8.201 "	6.772 "	0.655 "	0.240 "	0.116 "
10th	1014	1200	9.000 "	7.253 "	0.746 "	0.257 "	0.111 "
11th	1016	900	7.657 "	6.649 "	0.640 "	0.246 "	0.115 "
12th	1016	758	6.915 "	5.685 "	0.556 "	0.284 "	0.004 "
13th	1014	930	7.469 "	5.673 "	0.518 "	0.214 "	0.027 "
14th	1015	1120	7.804 "	6.612 "	0.514 "	0.278 "	0.099 "
15th	1018	1058	9.416 "	7.816 "	0.542 "	0.289 "	0.176 "
16th	1024	609	7.637 "	6.375 "	0.510 "	0.203 "	0.116 "
17th	1024	675	8.842 "	7.368 "	0.563 "	0.203 "	0.131 "
18th	1024	635	8.727 "	7.340 "	0.439 "	0.238 "	0.152 "
19th	1029	480	6.839 "	5.643 "	0.310 "	0.206 "	0.099 "
20th	1026	540	6.756 "	5.532 "	0.559 "	0.232 "	0.112 "
21st	1022	790	6.522 "	5.129 "	0.681 "	0.296 "	0.159 "
22nd	1020	714	7.494 "	6.195 "	0.620 "	0.195 "	0.151 "
23rd	1025	520	7.075 "	5.312 "	0.456 "	0.195 "	0.097 "
24th	1022	748	8.772 "	7.223 "	0.643 "	0.250 "	0.149 "
25th	1012	1330	9.007 "	7.554 "	0.667 "	0.266 "	0.088 "
Averages.							
Period A	...	...	8.121	6.803 (83 %)	0.627 (7 %)	0.246 (3 %)	0.084 (1 %)
" B	...	...	8.105	6.690 (82 %)	0.485 (5 %)	0.233 (2.8 %)	0.114 (1.4 %)
" C	...	...	7.60	6.157 (81 %)	0.604 (7.9 %)	0.239 (3.1 %)	0.126 (1.6 %)

on the fixed diet and at rest, and was apparently uninfluenced by the adrenalin injections.

It may be concluded, then, that the injection of adrenalin has no influence in altering the protein metabolism in Graves' disease, just as it has no influence upon the total nitrogenous excretion of the healthy dog when on a sufficient diet (Underhill and Clossan). Consideration of the distribution of the different nitrogenous constituents of the urine shows very little change. Urea nitrogen seems unaffected. During period B there is a fall in the percentage excretion of ammonia nitrogen, not an increase, as has been found in animal experiments under adrenalin injections by some observers, though more recent observations go to prove that in the healthy animal ammonia nitrogen is *not* increased at the expense of urea. Corresponding with this decrease in ammonia nitrogen there is an equivalent percentage increase in the residual nitrogen. Kreatinin nitrogen and uric acid nitrogen remain practically unaffected in the three periods.

From this observation it may be concluded that adrenalin chloride has no influence on the protein metabolism in exophthalmic goitre.

CASE II.—Female, age 37, married. Admitted to the Royal Infirmary complaining of "swelling of the neck." Seven weeks before admission the patient noticed that there was a swelling in the neck. It caused her no inconvenience. For some time previous to this she had been troubled with palpitation, especially if she walked quickly or went upstairs. Her friends noticed that her eyes had become more prominent than formerly. For a month her hands had been very shaky. The family and personal history were uneventful, and the patient's social history and surroundings good.

On examination the patient was found to be a fairly well-developed woman; nutrition somewhat poor. The skin was soft and moist; no oedema. The mucous membranes showed some pallor. The eyes were prominent; the expression happy; the manner and mental state distinctly emotional. The thyroid was much enlarged, and pulsation was palpable. There was no enlargement of the spleen or the lymphatic glands. The blood showed some anaemia, and a differential count disclosed a lymphocytosis. There was considerable complaint of shortness of breath and palpitation. Pulse frequency 116, regular in rhythm, rise and fall sudden; vessel wall healthy; systolic blood-pressure 125 mm. Hg. The cardiac pulsation was diffused. The area of cardiac dulness enlarged. A systolic murmur was audible all over the precordial region, the great vessels in the neck, and the thyroid. Examination of the nervous system showed intelligence somewhat

above the average. Sleep was good. Temperament distinctly emotional. The reflexes were found exaggerated, and there was a marked tremor in the hands and eyelids. The eyes were prominent; the palpebral fissure increased; von Graefe's sign present. There was some defective power of convergence in the right eye. The alimentary, respiratory, and urinary systems showed no abnormality.

After a period of rest in bed the patient was placed upon a fixed diet (mixed). During a period of sixteen days the nitrogen excretion by the urine was estimated (Table II.). The observation is divided into two periods of eight days each. During the first period of eight days no medicinal substances were exhibited; during the second period 10 grains of adrenal gland extract (whole gland) were administered thrice daily, the patient thus receiving 30 grains *per diem*. Examination of the table shows that under the adrenal gland extract there was a slight diuresis, and this diuresis was accompanied by a definite fall in the total nitrogenous excretion, the fall averaging over the period 1.88 grammes *per diem*. When the distribution of nitrogen is examined the fall in nitrogen excretion is found to be distributed over all the nitrogenous constituents of the urine, the percentage distribution of nitrogenous substances remaining undisturbed.

During the period of stay in hospital the adrenal gland extract was continued, and the patient was discharged very much improved, having put on ten pounds in weight. Though the thyroid remained enlarged the symptoms of hyperthyroidism had diminished considerably.

This observation would support the view that in adrenal gland extract we have a substance which tends to counteract the abnormal and excessive protein metabolism, which is one of the features of Graves' disease.

CASE III.—A male patient, age 27, was admitted to the Royal Infirmary complaining of "prominence of the eyes, swelling of the neck, and palpitation." The history showed that the patient had enjoyed good health until six months before admission, when his attention was called to the prominence of the eyes. He began then to feel nervous, and he noticed that he suffered a good deal from palpitation. These symptoms continued until admission. The patient's previous health had been good, his home surroundings satisfactory, and the family history uneventful.

On examination patient was found to be a somewhat poorly developed man—somewhat emaciated; manner exceedingly nervous. The thyroid was found diffusely enlarged, rather more on the left side than on the right. Exophthalmos was very marked, especially on the right side. The palpebral fissure showed considerable increase. Von Graefe's sign was present. A marked tremor was present in the outstretched hands and in the eyelids. There was complaint of palpi-

TABLE II.

CASE II.—SUPRARENAL GLAND SUBSTANCE.

Day.	Amount in c.cm.	Specific Gravity.	Total Nitrogen.	Urea Nitrogen.	Ammonia Nitrogen.	Kreatinin Nitrogen.	Urea Acid Nitrogen.
1	1795	1020	23.170	20.9584 (90.45)	0.578 (2.49)	0.337 (1.45)	0.1480 (0.63)
2	1795	1020	23.170	20.9584 (90.45)	0.578 (2.49)	0.337 (1.45)	0.1480 (0.63)
3	1780	1022	22.478	19.8861 (88.46)	0.498 (2.21)	0.254 (1.13)	0.1779 (0.73)
4	1630	1020	19.671	18.0734 (91.87)	0.475 (2.41)	0.233 (1.18)	0.1547 (0.78)
A 5	2020	1020	24.151	21.7190 (89.92)	0.520 (2.15)	0.304 (1.25)	0.1489 (0.61)
6	1820	1019	21.352	18.3965 (86.15)	0.418 (1.95)	0.238 (1.11)	0.1569 (0.73)
7	1765	1018	19.273	17.4452 (90.51)	0.395 (2.05)	0.252 (1.30)	0.1036 (0.53)
8	1900	1020	25.803	20.2692 (78.55)	0.532 (2.06)	0.248 (0.96)	0.1828 (0.79)
9	1780	1020	21.880	19.2382 (87.92)	0.493 (2.25)	0.218 (0.99)	0.1512 (0.63)
10	2040	1018	19.706	17.9356 (91.01)	0.480 (2.43)	0.227 (1.15)	0.1271 (0.61)
11	1880	1020	20.687	18.4240 (89.05)	0.532 (2.56)	0.214 (1.17)	0.0939 (0.45)
B 12	1700	1018	18.040	15.8508 (87.86)	0.385 (2.13)	0.195 (1.08)	0.1338 (0.74)
13	1840	1018	18.702	16.8470 (90.08)	0.494 (2.64)	0.230 (1.22)	0.1609 (0.86)
14	2274	1017	22.603	18.7832 (83.09)	0.158 (2.02)	...	0.1846 (0.81)
15	2160	1016	20.503	18.3251 (89.38)	0.574 (2.80)	...	0.1214 (0.53)
16	1810	1022	21.894	20.4240 (93.28)	0.491 (2.24)	0.235 (1.07)	0.1583 (0.72)
AVERAGES OVER PERIOD BEFORE SUPRARENAL AND WITH SUPRARENAL.							
Averages.							
Period A	1813	1019	22.383	19.7132 (88.07 %)	0.4993 (2.23)	0.275 (1.22)	0.1526 (0.68)
" B	1935	1018	20.502	18.2285 (88.9 %)	0.4886 (2.38)	0.224 (1.09)	0.1414 (0.58)
Difference	+122	...	-1.881	-1.485	-0.011	-0.051	-0.011

(The figures in parentheses represent percentage of total nitrogen.)

tion and shortness of breath. The cardiac pulsation was diffused and the area of cardiac dulness enlarged. A mitral systolic murmur was audible. The pulse frequency was 138 per minute, the pressure low; the radial vessel healthy. The patient was very excitable and emotional. Sleep was disturbed. All the reflexes were found exaggerated, especially the superficial. The patient was placed at rest in bed, and tincture of belladonna and digitalis administered. No improvement seemed to follow this line of treatment. After a period of rest without any medicinal substances the patient was placed upon a fixed diet, and the nitrogenous excretion by the urine estimated. The results of the urinary analysis are given in Table III.

The observation is divided into two periods of ten days. During the first period no medicinal substance was administered; during the second period the patient received extract of parathyroid gland. Examination of the table shows that during the period of the experiment nitrogenous excretion remained fairly constant. On an average during period B there was a fall in the total nitrogen excretion of one gramme *per diem*. This fall in excretion is almost wholly confined to the urea nitrogen. There is no increase of the ammonia nitrogen at the expense of the urea. There is a slight increase in the kreatinin nitrogen, but this increase is so slight as to be almost negligible. The uric acid nitrogen remains practically constant.

From this observation it would appear that parathyroid gland substance may have a retarding influence in the protein metabolism of Graves' disease, and supports the view that the thyroid and parathyroid are mutually antagonistic in their action. It seems to show, however, that the influence exerted by the parathyroid in conditions of hyperthyroidism is not great—the thyroid had, in fact, such a preponderating influence that parathyroid control had but a limited influence in diminishing excessive metabolism.

CASE IV. — Female, age 38, married. Admitted to the Royal Infirmary complaining of "palpitation, nervousness, and swelling of the neck." The swelling of the neck was first noticed a year previous to admission. Palpitation and some dyspnoea on exertion developed, and she became nervous and excitable. Shortly before admission patient contracted a "chill," which markedly accentuated her symptoms.

The only previous illness of importance was rheumatic fever early in life. The family history was satisfactory, the social surroundings favourable. On examination the patient was found to be a somewhat anæmic-looking woman. Emaciation was marked; the temperament obviously nervous and emotional; the hair grey but abundant; the

*Parathyroid.**On the Treatment of Exophthalmic Goitre*

Date.	Specific Gravity.	Amount in c.cm.	Total Nitrogen.	Urea Nitrogen.	Ammonia Nitrogen.	Kreatinin Nitrogen.	Uric Acid Nitrogen.
November.							
4th	1021	1500	17.088	15.408 (90.16)	0.630 (3.68)	0.317 (1.85)	0.223 (1.30)
5th	1023	1780	22.172	19.480 (87.86)	0.748 (3.37)	0.446 (2.01)	0.280 (1.26)
6th	1021	1970	22.001	19.629 (89.22)	0.872 (3.96)	0.370 (1.68)	0.266 (1.20)
7th	1018	2200	21.182	18.964 (89.53)	0.819 (3.86)	0.367 (1.73)	0.212 (0.99)
8th	1020	1860	20.200	17.752 (87.88)	0.828 (4.15)	0.373 (1.84)	0.223 (1.10)
A 9th	1020	1480	17.109	15.285 (89.34)	0.663 (3.87)	0.330 (1.92)	0.223 (1.10)
10th	1018	1840	19.416	16.994 (87.52)	1.288 (6.63)	0.346 (1.78)	0.200 (1.03)
11th	1022	1770	20.808	18.627 (89.51)	0.763 (3.66)	0.409 (1.96)	0.221 (1.06)
12th	1017	2080	16.707	14.319 (85.70)	0.658 (3.93)	0.297 (1.77)	0.200 (1.19)
13th	1018	2060	19.430	17.642 (90.79)	0.929 (4.77)	0.387 (1.99)	0.211 (1.08)
14th	1021	1720	19.305	17.186 (89.02)	0.809 (4.19)	0.431 (2.23)	0.245 (1.26)
15th	1020	1715	17.520	15.840 (90.40)	0.788 (4.49)	0.322 (1.83)	0.146 (0.83)
16th	1020	1930	18.420	16.096 (87.38)	0.805 (4.37)	0.446 (2.42)	0.210 (1.13)
17th	1019	1590	16.065	14.017 (87.25)	0.668 (4.15)	0.299 (1.86)	0.141 (0.87)
B 18th	1022	1820	18.389	16.249 (88.36)	0.724 (3.93)	0.390 (2.12)	0.218 (1.18)
19th	1020	2080	19.386	17.056 (87.98)	0.792 (4.08)	0.417 (2.15)	0.161 (0.83)
20th	1900	20687	20.687	18.134 (87.65)	0.802 (4.16)	0.408 (1.97)	0.214 (1.03)
21st	1022	1400	16.262	14.459 (88.91)	0.643 (3.95)	0.351 (2.15)	0.191 (1.17)
22nd	1024	1700	21.889	19.033 (86.95)	0.962 (4.39)	0.444 (2.02)	0.246 (1.12)
23rd	1020	1860	17.908	15.773 (88.07)	0.766 (4.27)	0.430 (2.40)	0.207 (1.15)
Averages.							
Period A	1019	1854	19.61	17.4 (88.7)	0.822 (4.14)	0.364 (1.85)	0.221 (1.12)
" B	1020	1795	18.58	16.3 (87.7)	0.782 (4.2)	0.391 (2.2)	0.198 (1.07)
Difference	...	...	1.03	1.1	0.040	...	...

(Figures in parentheses represent percentage of total nitrogen.)

skin moist. There was a very pronounced thyroid swelling, especially of the right lobe. No enlargement of the lymphatic glands. Examination of the blood showed some anemia and a relative increase in the lymphocytes. The heart was dilated and a soft blowing mitral systolic murmur was audible. The pulse frequency was increased, the vessel wall was normal, and the pressure low (S. B.-P. 115 mm. Hg). The pulse frequency was easily disturbed, the excitement of examination producing palpitation. Exophthalmos was marked, the palpebral fissure increased, the power of convergence deficient, and von Graefe's sign well marked. A fine tremor was present in the hands and eyelids. The superficial and deep reflexes were exaggerated.

The patient was placed upon a fixed diet while at rest in bed. When nitrogenous balance had been established the urinary nitrogenous excretion was estimated. Table IV. shows the results. During the first seven days no medicinal agent was employed; during the second period of seven days the thyroid gland was exposed to the action of the X-rays. A daily dose of 1 H. unit was administered. The direction of the rays in relation to the gland was varied each day, so that a different portion was irradiated daily. The tube used was a moderately "hard" one, and the softer rays were filtered off by a screen of aluminium.

Table IV. shows that during period B there was a very pronounced fall in protein metabolism. The total daily excretion of nitrogen fell during period B 2.23 grammes *per diem*. This fall was entirely due to a fall in the urea nitrogen. Though there was a slight fall in all the nitrogenous constituents of the urine, the fall in ammonia, kreatinin, and uric acid was very small, while the percentage proportion remained constant, except in the case of ammonia, which showed a slight percentage increase during period B. During the period of observation there was a gain in weight. After some weeks of rest the patient left hospital very much improved, to return in a month for a further course of X-rays. Though the thyroid tumour remained apparently unaltered, the symptoms of hyperthyroidism were markedly relieved. The patient felt very much better, and when discharged the gain in weight had been progressive. On return to hospital patient stated that she had enjoyed better health than since the commencement of her illness.

From this observation it may be concluded that the X-rays have a very definite effect in controlling the hyperactivity of the thyroid gland in Graves' disease.

CASE V.—A female patient, age 27, single. Admitted to the Royal Infirmary, September 1914, complaining of swelling in the neck and

TABLE IV.
CASE IV.—X-RAYS, APRIL TO MAY 1913.

Day.	Amount in c.cm.	Specific Gravity.	Total Nitrogen.	Urea Nitrogen.	Ammonia Nitrogen.	Kreatinin Nitrogen.	Uric Acid Nitrogen.
1	1022	1019	8.985	7.726 (85.98)	0.475 (5.28)	0.132 (1.46)	0.067 (0.74)
2	1078	1019	10.534	8.813 (83.66)	0.634 (6.01)	0.152 (1.44)	0.087 (0.82)
3	1078	1018	8.753	7.878 (90.00)	0.561 (6.40)	0.121 (1.41)	0.049 (0.55)
A 4	1646	1014	12.351	9.862 (79.84)	0.645 (5.22)	0.195 (1.57)	0.089 (0.65)
5	1079	1016	8.761	7.281 (83.10)	0.492 (5.61)	0.140 (1.59)	0.045 (0.51)
6	1079	1022	11.631	9.516 (81.81)	0.628 (5.39)	0.132 (1.13)	0.106 (0.91)
7	795	1018	7.100	6.121 (86.21)	0.400 (5.63)	0.094 (1.32)	0.059 (0.83)
8	1249	1019	11.226	9.652 (85.97)	0.629 (5.60)	0.143 (1.27)	0.062 (0.55)
9	908	1016	7.906	6.432 (81.35)	0.539 (6.81)	0.121 (1.53)	0.096 (1.2)
10	908	1017	8.059	6.686 (82.96)	0.534 (6.62)	0.100 (1.24)	0.095 (1.2)
B 11	709	1018	6.948	5.777 (83.14)	0.413 (5.94)	0.079 (1.13)	0.090 (1.3)
12	1363	1014	7.747	6.029 (77.82)	0.595 (7.68)	0.141 (1.82)	0.069 (0.11)
13	1022	1013	5.637	4.578 (81.21)	0.398 (7.06)	...	0.057 (1.01)
14	681	1016	4.976	4.118 (82.75)	0.412 (8.27)	0.078 (1.56)	0.068 (0.16)
Averages.							
Period A	1111	...	9.730	8.212 (84.3)	0.533 (5.49)	0.138 (1.41)	0.070 (0.71)
B	977	...	7.499	6.181 (82.4)	0.488 (6.5)	0.110 (1.46)	0.059 (0.77)
Difference	...	...	-2.231	-2.031	-0.045	-0.028	-0.011

(The figures in parentheses represent percentage of total nitrogen.)

breathlessness. Three years before admission the patient noticed a swelling in the neck; it gradually increased in size. Three months before admission she began to suffer from palpitation and occasional attacks of breathlessness. She would wake up feeling she was suffocating and with violent palpitation. She was very excited during the attacks. She began to feel very nervous, and suffered from dyspnoea on exertion. At night she was troubled with throbbing at both sides of the neck. The patient's previous health had been good, save for a mild condition of anæmia when 17 years of age. The family history was uneventful, the social surroundings satisfactory.

On examination the thyroid was found soft and greatly enlarged—slightly more so on the left than on the right side. Pulsation was palpable. The largest circumference of the neck over the thyroid was $14\frac{1}{2}$ inches. The external jugular veins were very prominent and showed pulsation.

During attacks of dyspnoea the patient became very excited. There was a marked tremor in the extended hands, eyelids, and tongue. There were occasional attacks of general tremor. The eyes were slightly prominent. Von Graefe's, Stellwag's, and Moebius' signs were absent. The reflexes were exaggerated, both superficial and deep. The circulatory system showed marked pulsation in carotids, thyroid, and jugulars. The cardiac pulsation was diffused; the area of dulness increased. There was a continuous blowing murmur audible over the thyroid, and a short blowing systolic murmur over the heart. The pulse frequency was 112; it was regular, rise and fall rapid; vessel wall healthy. On 14th October the patient was treated with radium by Dr. Dawson Turner, the total dose administered being 1110 milligramme hours. By 22nd October the patient had lost the feeling of lightness over the windpipe which had always been present before the radium was administered. She went home on 31st October feeling very much improved; the pulse was steadier, the tremor very much less, and the thyroid tumour smaller. In January 1915 the patient was re-admitted; she was obviously in better health, less emotional and nervous. The tremor in the hands was less, and the circumference of the neck was smaller by $1\frac{1}{2}$ inches. A second application of radium was made by Dr. Dawson Turner, the dose being 640 milligramme hours. The patient left hospital apparently well, with the thyroid tumour considerably reduced in size.

It is a matter of regret that exact figures of the nitrogenous excretion on a fixed diet cannot be given in this case. The observation broke down, as was the case with a number of other observations carried out on goitre cases. Metabolic observations on female patients are always difficult. Even with the most watchful care on the part of the nursing sister a loss of urine may

take place or menstruation may come on unexpectedly, and the observation is vitiated. The figures under such circumstances are not reliable, and are not included in this paper. If an observer desires to cultivate a habit of stoicism under failure, he has only to attempt metabolic work on female patients.

Experience in these cases and a considerable number of similar cases of Graves' disease leads one to certain conclusions as to value of remedial agents. The first duty of the physician is, by careful examination, to ascertain if there be any pathological condition which might possibly have a bearing on the disease. Graves' disease has been ascribed to a subinfection in which pyorrhea alveolaris is claimed to play an important part, and it is certainly a duty to see that any such possible source of infection is removed. The mouth in these cases should always be attended to and rendered as far as possible aseptic. The nervous and emotional condition of the patient, the state of circulation, and the increased metabolism demand rest, and that rest must be both *mental and physical*. Mental rest may induce sleep. If rest does not produce sleep, then medicinal substances must be employed to establish the habit of sleep. Of the simple hypnotics, chloral-amide is one of the best for the purpose. Massage has been advocated, but scarcely seems justified in the presence of such marked increase in the metabolic changes.

Particular care must be given to diet, which should be ample and contain a considerable proportion of protein. Milk is usually well borne by these patients, and may be freely used. At the same time care must be exercised that the digestion be not over-taxed. All cerebral stimulants, such as tea, should be avoided. Alcohol should only be permitted to those habituated to its use, as otherwise it acts as a protein poison and encourages protein metabolism.

Of medicinal substances, belladonna is constantly advocated. I have never been able to convince myself of any benefit following its use. The same seems to apply to digitalis, strophanthus, and other cardiac tonics. The heart seems to be under the control of a more powerful poison, and the pulse frequency is but little influenced by the administration of these substances, and they are liable to upset digestion, and do more harm than good.

Iodide of potash, and iodine preparations generally, can only do harm in Graves' disease, if we accept hyperthyroidism as the explanation of the symptoms. The iodine supplies the thyroid with necessary material for the formation of iodothyron, and the

symptoms of iodothyryn poisoning become more pronounced. No doubt a number of cases of Graves' disease are reported where iodides and even thyroid extract itself have done good. Were these true cases of Graves' disease? It seems much more probable that they were cases where the thyroid had hypertrophied in response to extra calls for work, and that then the iodine supplied necessary material for the formation of active secretion, and benefit resulted.

The deleterious effects of iodide of potash or thyroid extract in Graves' disease is in most cases so pronounced and definite that in early cases, where the diagnosis may be doubtful, their administration has been advocated as a means of establishing a diagnosis. Given a patient who has become nervous or excitable, shows some tremor in the hands and eyelids, and is subject to attacks of palpitation, the diagnosis may lie between neurasthenia and early Graves' disease. If, under such circumstances, hyperthyroidism be present, the exhibition of iodide or of thyroid extract will rapidly produce a profound effect. Tremor and tachycardia become more pronounced, and there is definite loss in weight, and the diagnosis of hyperthyroidism becomes established.

The treatment of Graves' disease by preparations of the milk of thyroidectomised sheep and preparations of the blood of thyroidectomised sheep have not, so far as my experience goes, given satisfactory results. In a few cases improvement appeared to take place for a time, but it was very difficult to ascribe this to the medicinal agent and not to the general hygiene and rest in hospital.

From experience gained by the influence of substances upon the metabolism in Graves' disease from the illustrative cases given and from others which have been under observation, it seems fair to conclude that adrenalin chloride has no influence in restraining excessive metabolism in Graves' disease. Extract of the whole adrenal gland has a certain definite influence in restraining excessive protein metabolism, and thus may have a useful *role* as a remedial agent. The usefulness of parathyroid extract is but small, and the impossibility of obtaining a reliable extract commercially precludes its general use. To obtain an extract which is reliable is prohibitive for general use on account of cost. Radium may be useful, but the difficulty of obtaining the treatment, except in large centres, is against its general application, and it must be remembered that the application of radium may result in a scar, a not unimportant point in dealing with female

patients. Treatment by X-rays is simple, and, so far as my experience in a number of cases goes, it is effective. A daily application for a week is followed in most cases by definite amelioration of symptoms. Excessive protein metabolism is restrained, and the patient gains in weight. A second application may be made at the end of a month or six weeks. A prolonged stay in hospital is not necessary, the patient resting at home in the intervals of treatment. X-rays and adrenal gland extract can usefully be combined in treatment.

My thanks are due to Dr. Dawson Turner for the application of radium, to Dr. Marion Erskine for the administration of X-rays, and to the sisters in charge of the wards, without whose sympathetic and intelligent co-operation metabolic observations are impossible.

THE OCULAR TROUBLES OF NEURASTHENIA.

By T. A. ROSS, M.D., Ventnor, Isle of Wight.

SYMPTOMS connected with the eyes are common in neurasthenia, and unless they are dealt with successfully they add seriously to the misery of the patient. Fortunately they are not very difficult to cure.

Muscae volitantes are a common source of annoyance to neurasthenic patients, but they are seldom complained of as such. The usual complaint is that the patient feels bilious. There is a widespread belief that specks floating before the eye have this signification, and it is undeniable that after a dose of calomel no more is heard of them for a little. But if the patient is undergoing a rest cure, where the aim is to increase his nutrition, the administration of calomel is not a good method to cure the trouble. Many patients dread that their digestions will not stand adequate feeding; and if the symptom recurs in a few days, as it may, the intelligent neurasthenic will begin to point out that a diet which upsets his liver so constantly cannot be good for him, and in this way the whole scheme of treatment may fail. It will be found that an explanation of what the phenomenon really is will put an end to it for good. The patient should be told that the specks are just specks in the eye, that everyone has them, that they are a trouble now only because his attention has been drawn to them, and that they will presently disappear. It is advantageous to be able to cite some parallel example. For instance, one may sit in a room with a ticking clock and not hear it till the attention has been drawn to it, and

then for a time one cannot help hearing it. With attention to other things the ticking disappears from consciousness.

Neurasthenic asthenopia is a much more serious symptom and yet is easily cured. The common story is that the patient cannot read for more than a very few minutes before something happens which makes further use of the eyes for near work impossible. Either the letters become blurred, or intense pain follows in the eyes or head, which may last for hours or even days. Accompanying this there is frequently photophobia, with redness and congestion of the conjunctiva; various other phenomena may be added—buzzings in the ears, giddiness, nausea, and many others. Sometimes these latter may remain as apparently independent symptoms, which will not be got rid of till their association with the asthenopia has been worked out and explained.

None of the symptoms that assail the neurasthenic is more distressing in itself or more potent of further evil to himself or his family than this. Unless he can manage to get someone to read to him he will be cut off altogether from the greatest solace that any invalid can get, the solace of books. He must spend many hours with nothing to do but brood over his fate, and that sometimes in the dark. If he can get someone to read, dreadful tyrannies are often set up when the most devoted member of the family may have to do so hour after hour, day after day. This is one of the symptoms that obtains for these sufferers the character of being selfish and wanting in will power.

In all cases it will be found that oculists have been consulted. Some patients derive no benefit from ophthalmic treatment, others get rid of their symptoms altogether for a time but relapse, others are cured permanently. The important point is not what the oculist prescribes, but how he examines and what he says. If he is a man who uses a cycloplegic and an astigmometer, and who is enthusiastic about corrections to $\frac{1}{8}$ of a diopetre, he will get some cures. Two things greatly please the neurasthenic—a deep interest in his case, and the information that his condition is physical and not “just nerves.” Such an examiner, by spending days with a cycloplegic, shows a proper interest, and will give the patient the feeling that he has been well examined, and the tendency to cure will be enhanced. But though relief may be got at first by such means, these cures are not always lasting, and even the most enthusiastic oculist will have his failures. Why, we shall see presently. The majority of specialists do not, however, seek to cure neurasthenic asthenopia by means of glasses. Usually

they tell the patient that the trouble is with the general health. To my mind this is an unfortunate statement, partly because it is not true, partly because it is apt to make the symptoms worse. Such a patient has without doubt been trying in vain for a long time to improve his general health, and here the last hope of getting his eyes better has been withdrawn till that health which he cannot get is attained. The truth is, that these symptoms do not depend upon health at all, but on a mental attitude, an attitude which it is remarkably easy to change.

In a former paper I gave an explanation of a possible mechanism by which this asthenopia might be produced, viz. by voluntary interference with automatic action, causing what Déjerine has well termed "dysharmony." Accommodation is normally entirely automatic. The neurasthenic, not seeing clearly from inattention, brings his mind again and again back to the subject, and peers to see more clearly, and in this way interferes with the normal automatism, and discomfort results. In another part of the paper alluded to stress was laid on the fact that the majority of neurasthenic symptoms begin as reactions to emotion—just as in the normal subject tears are the reaction to the emotion of grief—and from an analysis of a considerable number of cases I have no doubt that pain in the eye is a not uncommon reaction to depressive emotion. It is also a well-established fact that expectation of discomfort is a fruitful source of discomfort.

The majority of these cases of asthenopia can be explained by the action of one or more of the above factors. If the case began as emotional reaction to a strong stimulus, *i.e.* a really great worry, expectation might keep it going long after the original worry had ceased to act. Such a patient might well be cured permanently by an oculist whose procedure was sufficiently impressive. The glasses provided would get rid of the expectation, and as major worries are not encountered every day there would be no tendency to relapse. But if the symptoms arose from slight worry, and in profound neurasthenics they usually do, or if they are kept up by dysharmony, the success of the ophthalmologist will be short lived. The patient will be relieved for a little, but at the first worry that comes along he will have a reaction; the next thought will be that the glasses have not cured after all, and this will lead to further depression and further reactions, *i.e.* to increased symptoms. These may be even worse than the original symptoms, for now the patient has the feeling that a thing which had cured has failed, and with that comes the certainty that any treatment

can help him for a short time only and then is inevitably doomed to failure. This dashing down of the hopes which had been raised is one of the most serious things that can happen; everyone who sets out to cure a neurasthenic should bear in mind that if he does not succeed in making him much better he is quite sure to make him a great deal worse.

What, then, should the eye specialist do? He should correct any error of refraction that may be present, and if he recognises that the case is one of neurasthenic asthenopia he should warn him that if he is worried or depressed he will temporarily have a return of his symptoms. I believe that if this were done these patients would not suffer in the prolonged way in which they do. Above all, if the patient returns in a few weeks saying he got relief at first but is now as bad as ever, no attempt should be made to try the effect of turning the axis of a cylinder one or two degrees to the right or left. The good effect of this will be short. I have seen a lady who had had five such alterations made in the course of a single year without any but the most temporary benefit, and who was nevertheless able to read without glasses at all in perfect comfort a day or two after her symptoms had been explained. Her glasses were cylinders of $+0.25$.

This subject of cylinders of low power inevitably brings up the discussion, which has been a good deal revived of late, as to whether general nervous symptoms may not frequently be due to low degrees of astigmatism. It is really only a part of the larger question as to whether neurasthenic symptoms are reflexes of physical or of psychical disturbance.

In the paper referred to above some prominence was given to the reasons in favour of these symptoms being of psychical origin, and these need not be repeated. It may be worth while to give one or two reasons why it is not likely that they are of physical origin. Let it be understood that it is neurasthenia and not one of the psychoses that is under discussion. It is always the slighter manifestations of physical abnormalities which are blamed for the onset of neurasthenic symptoms. In the heyday of minor gynecology it was retroflexions, so-called ulceration of the cervix and the like, but never cancer. Where gastric conditions are held guilty it is the milder dyspepsias, but not such conditions as arise in cirrhosis of the liver. Where intoxication is blamed it is not the gross undoubted intoxications of alcohol, septicæmia, or diphtheria, but the vague attenuated intoxication of "sub-infection,"

or the curious condition called auto-intoxication. It cannot be urged that the well-known forms of physical disease or intoxication produce more striking symptoms. They do not. A badly, fully developed case of neurasthenia is quite as ill a person, till cured, as the worst case of physical intoxication or disease. Among those oculists who hold that errors of refraction may be the sole cause of a given case of neurasthenia, this astounding doctrine that the less potent the cause the greater the effect holds sway. It is not the cases of astigmatism that cause serious defect of vision that give rise to these symptoms; it is the cases where the patient is, as a rule, quite unaware that he has any visual defect at all. Even $\frac{1}{8}$ of a dioptré of astigmatism may cause the most marked symptoms. What is supposed to be taking place is that the patient is making a part of his ciliary muscle contract, thus inducing a lental astigmatism which will correct his corneal error. This is possible, but I do not believe that any astigmatic person with an error of 0.5 or under has the slightest desire to see any more clearly than he does already. There is no innate desire to see things absolutely sharp, especially if one has never hitherto done so. Moreover, low degrees of astigmatism are common to us all, and therefore we are asked to believe that a thing which is normal produces the most distressing set of symptoms to which the body is liable. Surely there must be some other factor. In every case of neurasthenia there will be found one common factor—mental depression—and when that has been removed by explanation of the true circumstances of the case the patient will be cured.

The above remarks have no reference to those cases of effective astigmatism with pain on reading, which are, of course, cured quickly and permanently by suitable glasses.

When I see a neurasthenic for the first time, and he has told me his symptoms, if he has not mentioned his eyes, I ask him whether they are all right, in accordance with the plan described elsewhere for the examination of these patients. He will then tell me of his difficulties if they exist. I then proceed with the examination, and when all is complete I tell him that all his symptoms will be cured, and that his eyes will be comfortable in a day or two. At the end of the first examination the patient should be quite ready to believe whatever he is told. The eyes have already been examined by a competent specialist, usually by several; and as the neurasthenic is a careful person, he has got all his prescriptions with him, and I see them at once. If he has

a real error, I tell him to wear his glasses always. If he has a fancy error, I tell him that it will not be necessary for him to wear glasses any more. As they have already failed to produce relief, he is pleased at this. I then usually tell him that I will explain the matter next day. On that occasion I tell him a little about the mechanism of accommodation, and show him how he became asthenopic, and why he remains so, explaining the phenomena of dysharmony and expectation of discomfort. I then tell him that he will be able to read a little to-day, say an hour or two in bits, and to-morrow probably all day. He may appear incredulous, but he will try, and next day he tells me that he has succeeded. I then tell him that on this doctrine slight relapses are inevitable, but that they will not last—that if he is annoyed at anything he will likely have one. I hear very little more about the eyes from these patients, and in a day or two I find their bed-tables littered with books. It is therefore untrue to say that the ocular symptoms depend on the general health.

Other functional eye symptoms, as micropsia, alterations in colour fields, etc., do not come within the scope of this paper. They are found in hysteria, but not in neurasthenia.

SECOND REPORT ON THE WORK OF THE CLINICAL MEDICINE RESEARCH LABORATORY, ROYAL INFIRMARY, EDINBURGH.

By H. RAINY, M.D.

SINCE the last report of the Clinical Medicine Research Laboratory was published in the *Edinburgh Medical Journal* for October, 1913, work has progressed steadily along the lines which have been already reported upon, whilst new investigations have also been undertaken. During the past eight months there have naturally been fewer workers in the laboratory, but at no time has research been altogether abandoned. A large collection has been made of electrocardiograms of various morbid cardiac conditions, and the laboratory is now in possession of over 1800 negatives. The electrocardiograph work remains in the hands of Drs. W. T. Ritchie and G. D. Mathewson, the former of whom has embodied his observations in a monograph on *Auricular Flutter*,* which was published last summer. In this he gives records and tracings of 11 personal cases, whilst

* *Auricular Flutter*, by W. T. Ritchie, M.D., F.R.C.P.E. (W. Green & Son, Ltd., 1914).

he discusses 42 additional cases which have appeared in literature. Dr. Ritchie has thus been enabled to construct a detailed clinical picture. He believes that the symptoms specially associated with auricular flutter are due to the high ventricular rate and to consequent alterations in the arterial and venous blood-pressure. The ventricular rate is, as a rule, about half that of the auricular, and is mainly increased at the expense of diastole, in consequence of which the myocardium has insufficient rest and its contractility is enfeebled. Clinically, auricular flutter occurs in paroxysms, which may subside in a few minutes or may be present for long periods, sometimes lasting for months at a time. The symptoms vary somewhat, according to the condition of the heart in which auricular flutter sets in. Hearts which to all appearance were previously healthy have a premonitory period characterised by tremor cordis; then palpitation is observed, accompanied by dyspnoea, precordial pain, weakness, and prostration, to which symptoms vertigo and syncope are often added, especially when the ventricular rate is high. At the same time the heart assumes the foetal rhythm, and dilatation gives rise to regurgitant murmurs. But more often the condition supervenes in cases where there is already chronic heart disease, and here the symptoms may closely resemble those of auricular fibrillation, while venous congestion speedily declares itself.

In cases of heart-block the symptoms are less marked; where the block is partial the ventricles do not act so rapidly as in those cases where conduction is more perfect, whilst, naturally, in complete heart-block the ventricular rate remains unaffected by auricular flutter, and no new symptoms supervene.

It thus becomes obvious that the symptoms ordinarily noted are not due to the altered state of the auricles, but wholly to the increased ventricular speed, and it is suggested that a functional inability of the *a-v* bundle to carry stimuli which follow one another with excessive rapidity is perhaps a protective function. One is thus brought into relation with the work already recorded by Dr. Ritchie on the effects of stimulation and paralysis of the vagus at the various parts of the human heart, and clear indications of the lines of treatment which are most likely to be successful can be recognised. By giving drugs of the digitalis group the conductivity of the bundle is markedly lowered, whilst at a later stage a similar disturbance of conductivity may be produced in the musculature of the auricle itself. Hence, if digitalis be given in such cases, the first effect is a lowering of the

ventricular rate, the ventricles contracting to every third auricular beat instead of responding to alternate beats; later, the ventricles will respond only to each fourth beat, when the pulse-rate falls to 70 or 80 per minute, and the patient experiences great relief. If digitalis is pushed still further, the auricular conductivity becomes affected, and flutter gives place to fibrillation; at the same time the ventricular beats, though they remain at 70 to 80, become less regular in rhythm. Clinically, however, it does not appear that any material advantage is likely to accrue by pushing digitalis to such an extreme, and, as a rule, the best results are obtained by exhibiting digitalis or strophanthus in doses just sufficient to allow the ventricle to respond to every fourth auricular impulse.

Occasionally it has been observed that when digitalis has been pushed to the extent of causing auricular fibrillation, the auricles may resume their normal rhythm some days after the exhibition of digitalis has been discontinued. Such resumption of the normal has been noted at intervals varying from the third to the twenty-third day after discontinuance of the drug, but its occurrence cannot be counted upon.

The monograph is illustrated by a large number of electrocardiograms, whose production was only possible by the close relationship which has been established between the laboratory and the medical wards of the Infirmary.

Dr. Mathewson's work is, for the most part, as yet unpublished, but a paper will shortly appear in the *Quarterly Journal of Medicine* on a most interesting case in which rhythmical changes in the mode of the heart's contraction were observed. At some times the beat was initiated at its normal situation in the sino-auricular node; at other times an abnormal beat replaced the normal, and appeared to take its origin in the atrio-ventricular node. The paper discusses very fully the various explanations which may be given to account for the condition, and the author suggests that it is essentially a manifestation of rhythmic variation in the tone of the vagus mechanism of the heart.

Further work has also been done in connection with the heart sounds and their relation to the contraction of the heart by means of the Beck-Thoma apparatus, but the research has not been carried sufficiently far to permit of publishing results at present.

A new research was undertaken by Dr. Comrie during the period under report in connection with the permeability of the

kidneys in disease, and he has furnished the following résumé of his results:—

The method of testing renal insufficiency is by injecting a measured quantity (1 c.c.) of phenol sulphone phthalein, 1 in 1000 solution, into the subcutaneous tissues of the patient whose kidneys it is desired to test. At the same time the patient drinks a quantity of water sufficient to stimulate the kidneys (about 200 c.c.). The urine is collected separately at the end of one, two, and three hours subsequently, and the amount of the phenol sulphone phthalein which has been excreted by the kidneys is estimated by means of an Autenrieth colorimeter. About 100 cases have been tested in this way from the Infirmary, and the Deaconess and Longmore Hospitals. The results in 50 of these cases are given below.

By trial in a number of healthy persons with heart and kidneys apparently unaffected it was found that the average excretion of phenol sulphone phthalein under the above conditions was—at the end of one hour 55 per cent.; at the end of the second hour 18 per cent.; at the end of the third hour 4 per cent., making in the first three hours a total of 77 per cent. This figure agrees closely with that originally obtained by Rowntree and Geraghty.

In 18 cases of undoubted parenchymatous degeneration of the kidneys, as shown by the constant presence of albumin, tube casts, œdema, and other symptoms, the average figures were: first hour, 11·8 per cent.; second, 12·1 per cent.; and third, 5·9 per cent.—in all, 30 per cent. On the other hand, in three cases of well-marked advanced interstitial nephritis (arteriosclerotic atrophy of the kidney) with blood-pressure over 180 mm., the average figures were 8 per cent., 18 per cent., and 29 per cent., making 55 per cent. in all. It was found that in diabetes mellitus there is constantly a considerable amount of phenol sulphone phthalein retention; in 4 cases tested the percentages for three hours were respectively 28 per cent., 29 per cent., 42 per cent., and 37 per cent. That this was not caused by any chemical reaction between the sugar and the pigment was proved by adding a known quantity of the pigment to a diabetic urine, with which it was allowed to remain in contact for 24 hours and subsequently tested.

In valvular heart disease, even when accompanied by venous congestion and transitory albuminuria, there does not seem to be a great diminution in the phenol sulphone phthalein excretion, so long as the general strength of the patient is maintained. In ten cases with various valvular lesions the excretion in three

cases amounted to 64 per cent., but in ten other cases of heart affection (myocarditis or valvular) from the Longmore Hospital, showing marked general enfeeblement, the average excretion amounted only to 34 per cent. If one combines all these heart cases, one finds that the average excretion, when there is no permanent involvement of the kidneys, amounts to about 50 per cent.

It should be observed that the amount of urine secreted bears no relation whatever to the excretion of the phenol sulphone phthalein.

Another important point with regard to the phenol sulphone phthalein test is that of the conspicuous delay which may take place in excretion, the bulk of the phenol sulphone phthalein excreted in marked cases of nephritis being got rid of during the second hour, instead of the first hour as in normal cases.

MATERNITY AND CHILD-WELFARE.

By A. DINGWALL FORDYCE, M.D.

FROM time immemorial the importance of maintaining, or, if possible, increasing the human basis of an empire or nation has been freely recognised, and in recent times a falling birth-rate and an immense infantile mortality rate have stimulated many nations to the necessity of infant-welfare work. In our own Empire, our own country, our own town, great steps in advance have been taken within recent times, and much good work has been done; but unquestionably in many respects the work has been half-hearted. The soul of Society, until recently, has hardly been touched. Now it is bare, sensitive, and responsive. Is it not the time to prepare for the solemn process of rebuilding which must soon occupy all our energies? And is there any social work which can possibly be of more Imperial benefit than the safeguarding of motherhood and the rearing of healthy children? The call of war is of supreme importance and urgency, but we are at war for peace; through war we seek a better and fuller peace, and during war we must, as far as possible, prepare for peace.

To the present writer it would seem that in connection with maternity and child-welfare work in Edinburgh such preparation is embodied in two words—co-operation and systematisation. We want thoroughness, we want conservation of energy, and we want the subject dealt with as broadly as possible. The accompanying diagram is given as an aid to the following text.

What, then, does our diagram imply? In the first place it implies the formation by the town of a Committee on Maternity and Child-Welfare. Much good work is being done at present under the aegis of the public health authorities and the parish council, and by charities and voluntary agencies. Such division of the work is highly desirable. But it is also advisable that a responsible practical body should exist to act as an advisory committee, to keep in due perspective the needs of the town as a whole, to act as a unifying agency, and as one formed to survey impartially all the activities in the city. Our diagram, then, is intended to suggest the formation of a Civic Advisory Committee on Maternity and Child-Welfare.

The natural nucleus of maternity and child-welfare work is a Maternity Hospital. In the maternity hospital we have a pre-maternity ward, and also nurses for both in- and out-door duty. There have also recently been initiated in connection with the maternity hospital infant clinics, at which the mothers with the babies who have been born in the hospital attend and get advice so that health may be preserved. Closely associated with the hospital is the Lauriston Pre-Maternity Home, and looking to the extremely valuable work this Home does, it is possible that a fuller general scheme would include encouragement to extension of this branch of the work.

Ante-natal home visitation to be fully undertaken along with post-natal home visitation necessitates the services of a large body of health visitors. We are fortunate in having in Edinburgh over 350 voluntary lady health visitors acting in close connection with the Public Health Department, and their assistance is indispensable in developing any scheme for child-welfare in the city. They have recently become more closely associated with the out-door work of the maternity hospital, and it is hoped that they will not only be able to undertake home visitation in the case of the pregnant mother and during the first year of the baby's life, but that they will be able to continue the supervision until the child is 5 years old—is of school age, and comes under the supervision of the School Board. There have recently been initiated by an independent committee five Schools for Mothers and Infant-Welfare Centres in the High Street, Grove Street, Dublin Street, Gorgie, and Stockbridge districts. At these Centres pregnant women and mothers with children under 5 years of age receive instruction weekly in simple cooking and sewing, attend "health talks," and are medically advised as to the best means of preserving their own and their children's health. It is obviously advisable that

these centres should be in close touch with the maternity hospital and the health visitors, and also with other child-welfare agencies.

The other agencies mentioned in the diagram of which I would make special mention, outside those within the central ring, are (a) day nurseries; (b) post-natal homes; (c) supervision of boarded-out babies.

Closer co-operation between day nurseries and the various other agencies is eminently desirable, both for the sake of the mother and child, more particularly now that the training of nursery nurses is being undertaken in connection with the day nursery (St. Bernard's Crescent).

In Edinburgh we have one post-natal home (Admiral Terrace) for the unmarried mother and her first illegitimate baby, and the very highly successful nature of this work, both as regards the morale of the mothers and the health of the children, makes development by inclusion in a broader scheme important.

As regards the supervision of boarded-out babies, it is extremely important that it should be much more strict than is at present the case. Although contrary to law, intimation is *not* always made when a baby is boarded out, and a large number of boarded-out babies *are* insured. Although under the Children Act (1908) the credentials required of near relatives for keeping the baby are much less exacting than those required from strangers, in not a few cases their home is *less* fitted to insure the baby's welfare.

The two final agencies mentioned in the diagram are milk depôts and infant hospital. The subject of the relationship between cow's milk and disease and the importance of the provision of pure milk for young children has been discussed almost *ad nauseam*. We do not want just now to criticise and pick to pieces. We want to assist in constructing an improved condition of affairs, to be jointly responsible for defects, and to attempt by close co-operation to obtain what has hitherto been unattainable.

By the term milk depôts do not let us understand complicated or expensive machinery and the preparation of elaborate milk mixtures. Let us understand rather simplicity and thoroughness, with the goodwill and co-operation of the dairies and possibly of the laboratory of the Royal Colleges. The Maternity Hospital is obviously a suitable centre for a simple milk depôt, and we have at least five subsidiary inquiry or distributing centres in the infant-welfare centres throughout the town. The last agency suggested in the diagram is that marked "Infant Hospital and Mothers."

It is universally recognised that for children under 2 years of

age, sick with gastro-intestinal disorder, the most important part of treatment consists in womanly care. The baby needs the attention of one woman for himself, and in an ordinary hospital for sick children he cannot get it. In all children's hospitals to which babies are admitted in any number, the mortality among them is very high. True, only the worst cases are admitted—cases which often are far past the possibility of saving. But just a little more attention often means so very much to a baby—it makes simply the difference between life and death. There are many baby-lives which would be saved were it possible to have just a little more done. It is often simply a question of close maternal care under close medical supervision for a day or two. A large or elaborate hospital is not needed. In most cases the patients would only remain in hospital for a few days, and large numbers could therefore be attended to in the year even in a small house. Into that house both baby *and mother* would be admitted whenever the mother could possibly be freed from other ties, and the mother would attend to her own baby.

Such are the various points noted in the diagram.

At the meeting of the British Medical Association in Aberdeen last July the following resolution was passed in the section on Medical Sociology, viz.:—"Looking to the present lack of co-ordination in the State, municipal and voluntary methods of dealing with children, this section unanimously recommends the Council of the Association to press for the formation of a Central State Authority to supervise child-welfare in all its aspects."

In many parts of the country and from divers social bodies similar calls have come for a special Government Department for Maternity and Child-Welfare as part of the Ministry of Public Health. In England and Wales grants in aid are made by the Board of Education and the Local Government Board to recognised co-ordinated agencies for maternity and child-welfare work.

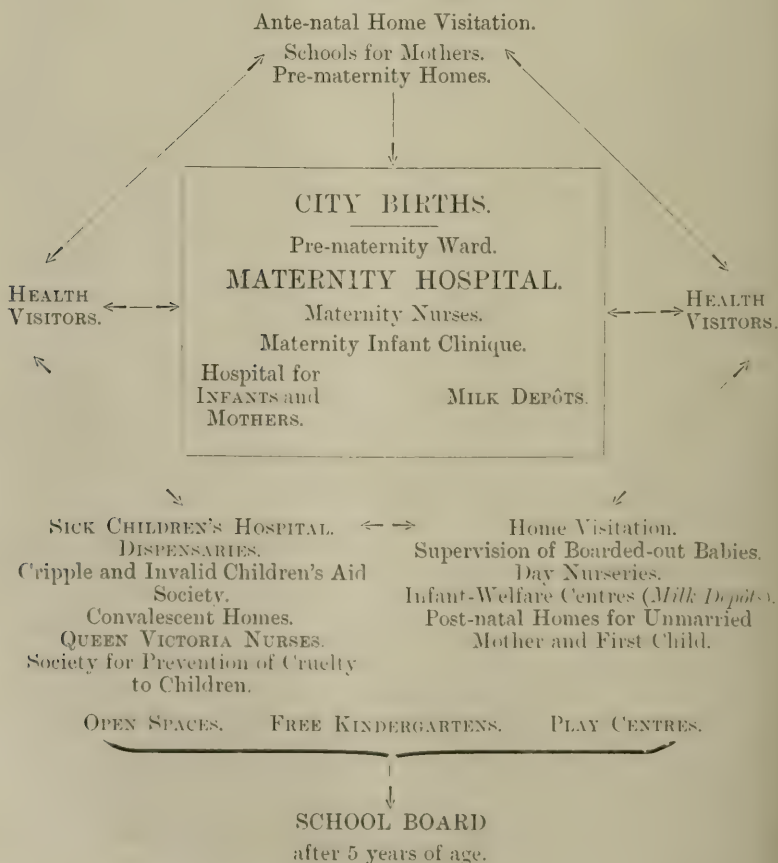
It is thus evident that there is abroad a widespread feeling that it is necessary to systematise work of this nature in order to secure thorough practical co-operation between all the various agencies which go to complete the scheme as a whole. If this is true of the nation, it is equally true of the city of Edinburgh! All agencies should be partners in a broad scheme. Each agency naturally desires and intends to carry out its own work in its own way, but all the agencies are striving for the same goal. We want an energetic, authoritative centre, and we naturally look to our public health department and our medical officer of health. We need to assist this centre with all the means at our command, and to

put at its disposal special knowledge and experience and facilities impossible for it to gain otherwise as an official body. Given such assistance and collaboration, we would look to our civic medical head and his advisory committee to act firmly and quickly.

Co-operation and systematisation do not imply expense and unnecessary labour. They mean increased efficiency, saving of labour, and the husbanding of funds.

PUBLIC HEALTH COMMITTEE
AND
MEDICAL OFFICER OF HEALTH.

SPECIAL CIVIC ADVISORY COMMITTEE ON MATERNITY
AND CHILD-WELFARE.



RECENT ADVANCES IN MEDICAL SCIENCE.

MEDICINE.

UNDER THE CHARGE OF

W. T. RITCHIE, M.D., EDWIN MATTHEW, M.D., J. D. COMRIE,
M.D., AND A. GOODALL, M.D.

THE OCULO-CARDIAC REFLEX.

THE oculo-cardiac reflex is the inhibition of the heart produced by ocular pressure. It is normally present but variable. In some it is more active than in others, and different effects may result from altering the duration and amount of ocular pressure. The reflex was first described by Aschner in 1908. The afferent impulse of the reflex passes by way of the fifth nerve to its nucleus, and the efferent passes out by the vagus. Levine (*Arch. Internal Med.*, 15th May 1915) gives a summary of the experimental and clinical observations in connection with this reflex and proceeds to describe his own. He studied the reflex by means of the electrocardiograph, and clinically observed 8 cases of tabes, 1 of taboparesis, 5 of syphilis (non-tabetic), 9 of chronic endocarditis, 1 of chronic endocarditis with auricular fibrillation, 5 of lobar pneumonia, and 1 of diabetes mellitus. The patients were placed in the galvanometer circuit, and an assistant exerted pressure on the eye. It is difficult to accurately measure the degree of pressure, but as nearly as possible a pressure was employed equal to 30 mm. of mercury. The eyelid is closed and the operator's thumb applied under the supra-orbital ridge, but not directly over the cornea.

In the 8 cases of tabes dorsalis the oculo-cardiac reflex was absent in 7, while one had a moderate reflex. This result corresponds to that of other observers. It is interesting to note that there is no relationship between the Argyll Robertson phenomenon and the oculo-cardiac reflex, as shown by the fact that in the tabetic with an oculo-cardiac reflex there was no reaction to light.

Tabetics do not have pain on ocular pressure as non-tabetics do. Some—five in all—had slight flushing of the face. Respiration was checked in two cases. In non-tabetics there is very considerable pain from ocular pressure, well marked flushing of the face and respiration was checked in fifteen of the 20 cases.

The cases of syphilis (non-tabetic) had normal oculo-cardiac reflex. The case of diabetes mellitus had no oculo-cardiac reflex. Levine is unable to say if this is typical of diabetes, as there are no records available. In the chronic endocarditis and pneumonia cases the oculo-cardiac reflex is normal. In the case with auricular fibrillation it was absent, but the reflex returned after treatment with digitalis.

He concludes :—

1. Ocular pressure affords a simple and safe method of obtaining reflex vagus inhibition of the heart.

2. Inhibition of the heart by the oculo-cardiac reflex is much more profound and more frequently obtained than by pressure over the vagus nerves.

3. The oculo-cardiac reflex is generally absent in tabes dorsalis, present in pneumonia, syphilis (non-tabetic), and chronic valvular disease.

4. The reflex was absent in one case of diabetes mellitus and also in one case of auricular fibrillation before digitalis treatment. It was present after digitalis was given.

5. Right ocular pressure has a slightly greater effect on the rate of the heart than the left. It may stop the heart for a long period of time; the P-waves are sometimes diminished in size and may become iso-electric. Occasionally the auriculo-ventricular interval is lengthened.

6. Left ocular pressure has a much greater effect on the conduction mechanism of the heart than the right. It may lengthen auriculo-ventricular conduction, cause partial heart-block, and result possibly in automatic ventricular rhythm.

7. Pain, flushing of the face, and apnoea during ocular pressure are much less pronounced in tabetics than in non-tabetics.

8. The effects on the rate and on the rhythm of the heart produced by ocular pressure are not constant, differing in different individuals and in the same individual from time to time. The duration and the degree of pressure play an important part in the degree of inhibition.

SPLENECTOMY IN PRIMARY PERNICIOUS ANÆMIA.

Roblee (*Journ. Amer. Med. Assoc.*, 16th March 1915) points out that during the year 1913 reports of cases of pernicious anæmia treated by splenectomy began to appear. Up to the present records of 40 cases have appeared. Such treatment, Roblee thinks, has a basis in reason, and he discusses the causes of pernicious anæmia and the relationship the spleen has to these suggested causes. It is fully recognised that the aetiology of pernicious anæmia is not definite, but it must be due to either (1) a disease of the blood-forming organs, or (2) an increased destruction of the blood-cells due to over-action of the blood-destroying organs. From the evidence at present in existence he concludes that disease of the blood-forming organs plays no part, but that the condition is due to a toxin or toxins. In intestinal parasitic diseases this is undoubtedly true, and in some cases bacterial action in the intestine may be responsible.

Eppinger first of all suggested splenectomy for pernicious anæmia, and J. H. King, working in his clinic, ascertained that in many cases of

pernicious anæmia there is an increase of the unsaturated fatty acids in the blood, and also that they are hæmolytic in action.

He also showed that the spleen has to do with the production of these fatty acids, and that therefore its removal appears to be indicated. In other cases Roblee thinks there is present a hypersplenism, which results in (*a*) overproduction of a hæmolytic substance not yet identified, and (*b*) an increased cellular activity with resultant red-cell destruction.

From these considerations Eppinger suggested splenectomy for pernicious anæmia, and since then 40 cases have been operated upon. Nine of these died at operation or shortly afterwards. No case has been definitely reported as cured, but invariably the procedure is followed by an immediate and marked improvement in the condition of the blood. The number of red cells rises rapidly. Cells of the megaloblastic type persist, and the blood did not in any case show a return to normal. The stomach symptoms improved in all the cases, and the patients gained decidedly in strength and spirits. He quotes Türk as giving the best summary of the question up to date. He says: "In none of the seven (Türk's) cases has the blood returned to normal. But a remarkably rapid and thoroughgoing remission may almost be counted on in apparently moribund patients; it acts more rapidly than arsenic and as promptly as thorium, but it does not seem to remove the cause of pernicious anæmia. The morbid spleen functioning is merely one link in the chain of factors causing the disease, but by removing it we make a gap in the chain, and even this is a great gain."

Roblee sums up by saying that as pernicious anæmia is due to a toxin, which may be of bacterial, chemical, or parasitic origin, with an increase of the fatty acids in the blood, and as the spleen elaborates or helps to elaborate these acids, and its removal does not affect a patient injuriously, and as invariably improvement has resulted which at any rate prolongs life, splenectomy should be invariably tried in pernicious anæmia along with any other methods at our disposal.

ROENTGENISATION OF THE THYMUS GLAND IN GRAVES' DISEASE.

Waters (*ibid.*, 24th April 1915) discusses this new method of treatment. He undertook the investigation at the instigation of Dr. Halsted, and in his paper reports on the method employed and describes his clinical results.

Altogether 60 cases were treated, and treated only by X-rays to the thymus gland. Three series of treatments were given—six treatments in each series, with intervals of from 2 to 3 weeks between each series. Irradiations of 6 minutes' exposure were given on six successive days in the first, second, and third intercostal spaces, along the right and left sternal margin. Then 2 weeks afterwards a second series was

given, and in another 2 weeks a third series. Some of his cases received only one or two sets of irradiations.

Sixteen patients received all the 18 irradiations. Eight are now "apparently cured," seven showed marked improvement, while one failed to respond to treatment. Nine patients received 12 irradiations, with two cures, five showed marked improvement, and two very little change. Twenty-four cases received only one series or 6 irradiations. Definite conclusions could not be drawn in these cases, but some of them steadily improved after the treatment. Sixteen patients showed no change, four were slightly improved, two much improved, and two were operated on after three irradiations. The general health and nervous disturbance of the patients first of all improved. Later on there was a slowing of the pulse, and then improvement in the blood-picture. The exophthalmus showed very marked improvement in five cases, but this symptom was the most resistant to the treatment.

Waters concludes that "Roentgenisation of the thymus will cure, temporarily at least, some cases of Graves' disease. It will effect an apparent cure in some cases of hyperthyroidism when other measures have failed. Intensive irradiation under strict and rigid technic has no bad effect on patients with Graves' disease. From results obtained, evidence enough is at hand to warrant a more liberal employment of this treatment."

AUSCULTATION AT THE ACROMION PROCESS IN DIAGNOSIS OF EARLY PHTHISIS.

Two papers appear in the *Archives of Diagnosis* (April 1915) supporting the value of this sign—one by Abrahams, who two years ago first drew attention to its existence, and the other by Nathan Magida.

In his paper Abrahams restates his plea for employing auscultation over the acromion process as a valuable aid in the early diagnosis of phthisis. When first put forward the sign met with a considerable amount of adverse criticism, but on the whole, as he says, those who came to scoff remained to pray. Abrahams claims that certain auscultatory phenomena can be made out over the acromion process which cannot be elicited by direct auscultation of the apices. In incipient phthisis acromial auscultation on the right side gives almost tubular breathing with prolonged expiration (instead of the normal broncho-vesicular breathing) and marked whispered pectoriloquy. Over the left acromion one gets marked broncho-vesicular breathing instead of the normal vesicular, louder vocal resonance, and pronounced whisper sound. Auscultation over the acromion processes will reveal moist, dry, and musical râles which will not be heard directly over the apices, and strong coughing and deep breathing may bring out adventitious sounds not audible over the direct apices of the lungs.

Magida in his paper also enters a plea for the further consideration and development of Abrahams' auscultatory acromial sign. It is not claimed to be the only sign absolutely diagnostic of early lung tuberculosis, but it is a sign that more than many others gives a great deal of help. The sign is a constant one in incipient phthisis, and therefore an all-important one. Magida corroborated in many cases his diagnosis by means of X-rays, and out of 15 cases 8 were returned as positive, 3 doubtful, and 4 negative. To elicit the sign properly he lays down certain instructions:—

1. The bell of the stethoscope should not be of too large a circumference, as most of these patients are rather thin in the acromial region.

2. The patient should be instructed to breathe deeply and not noisily.

3. Examination of the nose should always be made before examining the acromion process—in fact before examining the apices—because patients with nasal obstructions of any kind give exaggerated breathing sounds over the apices, which are much more marked over the acromion process.

4. The heart should always be examined before the apices, as mitral disease usually gives a certain amount of congestion in this region somewhat resembling incipient tuberculosis.

5. Most important of all, the apices should always be examined before the acromion processes, as this method is really a comparative one, and its full value cannot be appreciated unless the examiner knows the normal sounds elicited over the apices.

E. M.

SURGERY.

UNDER THE CHARGE OF

J. W. STRUTHERS, F.R.C.S., AND D. P. D. WILKIE, F.R.C.S.

CLINICAL OBSERVATIONS ON BONE TRANSPLANTATION.

DEAN LEWIS (*Surg., Gynec., and Obstet.*, June 1915) records a series of cases of bone transplantation, the study of which has led him to accept the view of Axhausen, Phemister, and others, namely, that a transplant does not merely act as a scaffolding for developing osteoblasts, but that the compact bone is absorbed and replaced by bone formed by the periosteum and endosteum of the graft.

He finds that the smaller the transplant the greater is the proliferation. In large grafts, compact bone dies, because its physical properties do not permit of rapid enough absorption of serum to maintain the life of the bone until the vascular circulation is re-established. The periosteum and endosteum, he believes, are the most active bone-forming

elements. For these reasons he prefers to use the antero-medial surface rather than the crest of the tibia, as the former can be made to include both periosteum and endosteum without an undue amount of compact bone.

The first group of cases illustrate the effects of infection on bone transplantation and the use of bone grafting in infected wounds. Severe infection with extensive suppuration caused death, with subsequent extrusion of the entire transplant. Where there was a mild infection, the periosteum and endosteum of the transplant survived and the subsequent changes were the same as those seen in osteomyelitis affecting normal bone. The periosteum formed a layer of spongy bone resembling the involucrum, and the central part of the transplant in some cases became sequestered. In two of the cases the author implanted grafts into areas already infected, to act as mechanical support and prevent deformity. In both cases there was involucrum and sequestrum formation. This, he maintains, is conclusive evidence that the transplant may remain viable and react to infection like normal bone.

Two cases are recorded in which bone grafts were implanted into cavities after curettage of central giant cell sarcomas. The grafts were gradually absorbed on account of the formation of blood-clot which surrounded the grafts and deprived them of the serum so essential for their vitality. Such cavities, he states, can be most satisfactorily closed by bone plugs.

Two cases are cited in which the medial malleolus was excised and reimplanted in order to correct the deformity resulting from Pott's fracture. In both cases the malleolus survived.

The last group of cases recorded are those in which bone grafts were used for the treatment of delayed union and non-union of fractures. The bone graft apparently stimulates bone growth in the fragments and the osteogenetic power of the graft proper aids greatly in forming a firm union between the ununited fragments. Hence it is that surgeons are resorting more and more to bone grafting rather than to Lane's operation of bone plating. In only one of the recorded cases did the transplant die and become absorbed. In this case there was considerable oozing from dense scar tissue, difficult to control. The wound was not drained, and a hæmatoma formed. He again emphasises the fact that the presence of blood-clot around the graft prevents vascularisation of the transplant and is one of the factors which may cause the death and subsequent absorption of the transplanted bone.

One case is recorded in which a bone graft was employed for the treatment of ununited intracapsular fracture of the neck of the femur. A canal was bored through the great trochanter, and along this a "bone bolt" was driven. Such grafts, he maintains, have many advantages over foreign bodies, for they have proliferative power, and

an attempt can be made to reconstruct a neck with proper angle and of normal length.

The inlay graft in the treatment of old ununited or recent fractures is considered more satisfactory than the intra-medullary splint, for the endosteum of the shaft comes in contact with the endosteum of the bone, and the periosteum of the bone can be sutured to the periosteum of the graft. In the intra-medullary splint considerable endosteum is destroyed in preparing the medullary cavity for reception of the graft, and according to the author the endosteum is one of the important factors in bone repair.

It will be observed that Lewis is of the opinion that regeneration of bone is chiefly due to the activity of the periosteum and endosteum. Many authorities, however, among whom may be mentioned Macewen, Moore, Corbet, Hunnicutt, and Davis, maintain that the periosteum plays a very minor part in bone formation. Isidore Cohn and Gustav Mann (*Surg., Gynec., and Obstet.*, June 1915) give an account of experiments performed on dogs, with the object of investigating the origin of callus in the repair of fractures. The fibula was chosen for experiment, and fractures were made with the periosteum intact, or having previously been stripped from the bone. At variable intervals of time, ranging from 1 to 6 weeks, the site of fracture was examined. In slight injuries there was an exceedingly active proliferation of osteoblasts, with formation of new bone rich in osteoblasts. When, as a result of more severe injury, the blood-vessels of the Haversian system were ruptured the osteoblasts became converted into cartilage. The latter having acted for a time as a bond of union became invaded by an extension of the medullary spaces and transformed into bone. In no case was there evidence that growth of bone took place from the periosteum. Even without periosteum a very firm union was obtained, a phenomenon readily explained on the assumption that the union was brought about by special modification of the bone itself, and was not due to any activity on the part of the periosteum.

MILITARY SURGERY.

Professor von Eiselsberg (*Surg., Gynec., and Obstet.*, June 1915) has issued various recommendations under the title of "Ten Commandments," and distributed them to military surgeons in the present war. The fresh wound, he states, must not be touched with the finger. Antiseptics should not be applied, nor the wound and the parts around washed. Sterile white absorbent gauze should be put on and retained by bandage or adhesive plaster. For hemorrhage, if direct pressure by dressings is not sufficient, a tourniquet may be applied, but the use of instruments should be deferred if possible until a stationary hospital is reached. Only immediately before opening a wound for suppuration is it justifiable to use the finger or probe for investigating a wound.

Rehn (*Beitr. z. klin. Chir.*, 1915, xvi.) recommends that injuries from shrapnel and grenades should receive particular care. Early incision is necessary to allow of free drainage, and at the principal dressing station such wounds should be irrigated with hydrogen peroxide, Peru balsam poured in, and loose tampons applied.

Fractures should be immobilised by fixing the joint above and below. The Cramer wire splint is highly recommended. Fractures of the femur, the first-aid treatment of which is usually so difficult, are best treated by a modified Cramer splint. Two lateral wings are made to enclose the thigh and pelvis. Such a splint is specially of use in the transportation of the patient.

The extraction of projectiles is considered a pressing operation only in very rare cases. The foreign body should only be removed when there is some special indication, such as when it is causing serious symptoms or can be felt immediately under the skin.

Hofmeister (*Beitr. z. klin. Chir.*, 1915, xvi.) is of the same opinion. In discussing the use of the electro-magnet in the removal of bullets, he states that the mere presence of a foreign body on a Röntgenographic plate in itself is not a sufficient indication for an operation. The removal of a missile is indicated when shown to be in a location in which we know by experience that foreign bodies act harmfully, viz. in the eye, urinary bladder, trachea, etc., but a metallic foreign body is usually a harmless guest in the human body.

In all painful operations where morphine is not sufficient to allay the pain, ether anæsthesia should be used.

Where there is suppuration, free drainage should be made by incision and counter-incision and the insertion of drainage tubes. Packing of the wound is to be avoided.

In a swelling that is at first diffuse and later gives rise to fever and suggests an abscess, the surgeon is advised to consider the possibility of aneurism.

The wearing of rubber gloves at every stage in the treatment of wounds is strongly recommended for the sake of maintaining asepsis.

Operative procedures should, if possible, be delayed until the patient arrives in hospital. In severe injuries of limbs, extensive suppuration, gas phlegmon, or threatened gangrene, amputation should not be too long delayed and the life of the patient thereby endangered too much for the sake of saving an injured limb.

Lastly, he lays stress on the necessity for the dressings to be aseptic, and military surgery to be conservative.

J. N. J. H.

DERMATOLOGY.

UNDER THE CHARGE OF

W. ALLAN JAMIESON, M.D., LL.D., AND R. CRANSTON LOW, M.B.

AUTOSEROTHERAPY OF DISEASES OF THE SKIN.

THERE are certain conditions of the skin where there is extreme hypersensibility to external agencies, *e.g.* to the actinic rays of light. In order to try to desensitise the tissues the injection of fresh serum from the patient has been tried. Hilario (*Journ. Cut. Dis.*, 1914, p. 780) reports considerable success by this method. Blood is collected from a vein by a sterile needle into a sterile 50 c.c. glass vessel with cotton-wool stopper. It is kept in a cool place till it clots. The clot is then separated from the wall of the container by a sterile pipette, and the vessel placed in an electric centrifuge revolved at a speed of 3000 revolutions per minute. After 15 minutes in the centrifuge a clear serum can be obtained. The serum is decanted off into a 30 c.c. syringe and injected intravenously. The injection should be done slowly and repeated once a week. An hour to an hour and a half is required from the time the serum is withdrawn till it is restored to the patient. The blood should be allowed to clot thoroughly before centrifuging, as otherwise some hæmolysis may take place, and the serum would appear "tinged." The serum should be clear, light greenish-yellow in colour, and free from flocculent or shreddy precipitates, and when injected should give rise to no increase in temperature. If the patient has had a heavy meal before being bled, the serum may be opaque from the presence of chyle. Such a serum can be injected intravenously without risk. Even a serum mixed with a certain amount of red cells has been injected in several instances with innocuous effect.

The autoserum is capable of producing spontaneous involution of certain dermatoses, especially those of actinic and nervous origin and also those which have proved to be rebellious to chemical medication. It has also a marked antipruritic effect. The autoserum plays a very active part in the treatment of psoriasis by reducing the resistance of the lesions and rendering them more amenable to chrysarobin in weak percentages. Owing to the low percentage of chrysarobin necessary to bring about healing, the possibility of producing a secondary dermatitis is greatly reduced. While the autoserum, when it is aseptically and properly prepared, gives rise to no clinical reaction, it is capable of increasing the hæmolytic amboceptor in the serum of the individual into whom it is injected. The use of chrysarobin in psoriasis cases does not necessarily require to be delayed till a number of injections have been given. The

earlier the application of the chrysarobin the sooner the healing of the disease.

Hilario thinks that it is very likely that ferments are developed in the serum either in the interval between the withdrawal of the blood from the body and the restoration of the serum or after the injection of the autoserum. That this ferment has an antigenic power is strongly suggested by the extraordinary amount of hæmolytic amboceptor in the sera of all the individuals who were treated with the autoserum. That this is not capable of giving rise to any definite reaction is shown during the course of the treatment by the absence of any rise of temperature, headache, etc. That it has no positive chemiotaxis for the leucocytes is demonstrated by the absence of any change in the number of leucocytes after the injections. Such a hypothetical ferment may also be responsible for the antipruritic effect of the injections. That the results of the treatment are not due to suggestion is proved by the fact that no result was obtained in control cases where normal saline was used instead of the autoserum.

THE GERMICIDAL ACTIVITY OF CHRYSAROBIN AND CERTAIN OTHER MEDICAMENTS USED IN PSORIASIS.

In a recent abstract the work of Schamberg, Kolmer, and Raiziss, on the organisms found in psoriasis, was reported. These same authors (*ibid.*, 1915, p. 1), failing to find any direct evidence of a causal organism, have endeavoured to throw more light on the cause of the disease by studying the mode of action of chrysarobin and other drugs which are known to have a beneficial effect in that disease. They find that the experimental evidence indicates that three of the most important drugs used in the treatment of psoriasis, viz. chrysarobin and pyrogallie acid locally, and arsenic internally, do not exert their curative effects through a germicidal action on the cocci commonly found in psoriatic patches, taking the staphylococcus epidermidis albus as an example of the group. Even when a celloidin capsule containing chrysarobin and staphylococci is placed in the abdominal cavity of a rabbit, and the drug thus permitted to come into contact with the body juices, no germicidal action on the staphylococci is observed. Their results seem to show that these substances produce their effect either by some germicidal action on an unknown parasite which is especially sensitive or else by some biochemical reaction. In support of this is the fact that such strong antiseptics as carbolic acid, formalin, calomel, etc., exert no appreciable influence on the disease.

Further investigations into the biochemistry of chrysarobin by the same authors (*ibid.*, p. 115) show that the effect of chrysarobin is probably due to the chrysophanol-anthranol, which it contains. The chrysarobin is converted into chrysophanic acid by oxidation, and

this chrysophanic acid is therapeutically inert. Chrysarobin is a stable substance not readily oxidised by exposure to air and light, but in a watery suspension it readily oxidises in the presence of alkalis. It is capable of abstracting oxygen from the protein of the skin. This oxidation process is inhibited by mineral acids, and is due to their action on the proteins rather than on the drug itself. Chrysarobin has an exceptional affinity for the keratins of the skin, staining the surface layers with the well-known purple colour. This stain cannot be removed even by boiling the scales in glacial acetic acid. The staining is largely due to the oxidation of the drug in the horny layer, but some of the drug is carried into the deeper layers of the epidermis and even into the corium. The therapeutic effects of the drug in an ointment containing alkali is considerably diminished. The authors conclude that chrysarobin probably owes its good action in psoriasis to the three properties which it possesses—(1) its resistance to oxidation on exposure to air; (2) its strong reducing action; and (3) its affinity for and firm union with the proteins of the skin. It is possible that this chemical union and abstraction of oxygen has a restraining influence on the proliferative power of the epithelial cells.

CHANGES IN THE BLOOD IN VARIOUS SKIN DISEASES.

As very little is known with regard to the changes in the blood in skin diseases, Engman and Davis (*ibid.*, p. 73) have undertaken an investigation covering 72 different skin diseases. Naturally, in the rarer diseases, only one or two cases were examined. They found that about 38 per cent. showed a leucocytosis over 10,000 per c.mm. This was most marked in seborrhœic dermatitis, where it was present in eight out of ten cases. Eczema, dermatitis herpetiformis, pemphigus, syphilis, etc., showed it, but less markedly. In staphylococcal dermatitis, where a leucocytosis would have been expected, it was found only twice in eight cases. A diminution of the leucocytes was recorded in about 6.5 per cent. of the cases. These cases included such various diseases as Addison's disease, dermatitis herpetiformis, eczema, erythema induratum, morphœa, pemphigus foliaceus, etc.

On making differential counts the results were as follows:—

Polymorphonuclear Leucocytes.—An increase in these cells was most marked in a case of dermatitis herpetiformis, and there was no increase in any of the cases of staphylococcal dermatitis. In a case of mycosis fungoides treated with Coley's fluid there was a marked increase in these leucocytes after each injection.

The *large mononucleated leucocytes* were markedly increased in a great many conditions, such as acne, exfoliative dermatitis, dermatitis herpetiformis, seborrhœic dermatitis, eczema, lichen, psoriasis, syphilis, ichthyosis, impetigo contagiosa, etc. In every case this increase was at the expense of the polymorphonuclear leucocytes. It does not

seem to vary with the amount of the surface of skin involved, as it was just as marked in a localised condition such as acne as in ichthyosis.

The *lymphocytes* were, as a rule, relatively decreased in those cases where the large mononucleated cells were increased. In some cases of acne, seborrhoeic dermatitis, infantile eczema, and pemphigus these cells were also increased. The most marked case was one of general exfoliative dermatitis, where the lymphocytes constituted 67 per cent. of the leucocytes.

Eosinophile Leucocytes.—Engman and Davis found a marked increase in the eosinophiles in pemphigus foliaceus, pemphigus vulgaris, seborrhoeic dermatitis, dermatitis venenata, eczema, ichthyosis, mycosis fungoides, pediculosis corporis, and pityriasis rubra. In dermatitis herpetiformis, which is the disease in which most observers have recorded an eosinophilia, the authors found it in only 13 out of 27 cases, but it was obvious that a relapse was often signalled by a marked increase in eosinophiles.

ÆTIOLOGY OF ERYTHEMA NODOSUM.

Rosenow (*ibid.*, p. 408) claims to have discovered the causal organism of erythema nodosum. He excised one of the nodes with the skin, taking strict aseptic precautions. This tissue was emulsified and the emulsion planted into tall columns of liquefied ascites-dextrose agar. These cultures were incubated at blood heat for 10 days. The skin usually showed a few colonies of staphylococcus, and only twice contained the same organism as was found in the subcutaneous infiltration. From the subcutaneous node a polymorphous, sometimes clubbed, often curved, barred diplobacillus was isolated. This organism was obtained usually in pure culture in each of six cases of typical erythema nodosum. It was also isolated from a cervical gland, draining an infected tonsil in one case, in mixture from the tonsil in two cases, and from the blood in pure culture in two cases. The organism is markedly pleomorphic; in some cases it strongly resembled diphtheroid bacilli. All gradations from typical bacillus forms to typical coccus forms were found. On artificial cultivation and on passage through animals the pleomorphism largely disappears, and the organism becomes a small, chiefly Gram-negative, rod, and constantly after animal passage there is obtained a streptococcus, which decolourises readily with Gram, and gives a greyish-brown growth on blood-agar, and forms chains in dextrose broth and milk. The author considers that, as all intermediate forms between a bacillus and coccus are found, he is dealing with one and not two organisms. When injected into dogs, rabbits, and guinea-pigs it showed a striking affinity for subcutaneous tissues, producing localised subcutaneous hæmorrhages, followed by infiltration and migration of leucocytes and enlargement of the adjacent lymphatic glands. These hæmorrhages

were often symmetrical, and from them the organism was repeatedly isolated. After artificial cultivation or passage through animals the organism loses its affinity for the subcutaneous tissues. But in passage through animals its virulence is increased, and it becomes a streptococcus, with an affinity for joints, muscles, and endocardium, producing non-suppurative arthritis, myositis, and simple endocarditis. Rosenow claims that it is the cause of erythema nodosum, and that rheumatism, scarlet fever, measles, diphtheria, etc., predispose to the disease by damaging the tonsil and allowing the infection to gain entrance.

R. C. L.

NEW BOOKS.

The Commoner Diseases: Their Causes and Effects. By Dr. LEONARD JORES, Marburg. Authorised English Translation by WILLIAM H. WIGLUM, M.D., Assistant Pathologist to St. Luke's Hospital, New York City. Pp. xvi. + 424. With 250 Illustrations. Philadelphia and London: J. B. Lippincott Co. 1915. Price 16s. net.

THIS is a translation of a series of lectures primarily published by Professor Jores in order to give his students a living interest in the relation of pathological to clinical conditions. Only the commoner diseases are dealt with, and appended to the description of the morbid anatomy of each disease is an account of its sequelæ and usual complications. Thus under arteriosclerosis are not only described the changes in the large and small arteries, but the secondary effects of these on the system as a whole. Thus cirrhotic kidney, cardiac hypertrophy, the effect of arteriosclerosis on the coronary arteries, aneurism, cerebral hæmorrhage, thrombosis, and embolism are all analysed. In a similar way the ravages of appendicitis, tubercle, cancer, and all the other states that one meets with in everyday practice are taken up and described. There are several chapters devoted to the various blood diseases. In discussing the cause of pernicious anemia attention is called to the constant presence of atrophy of the gastric mucous membrane. Some pathologists have looked upon this as the cause of the condition, but Jores inclines to the belief that these are co-ordinated processes due to the same intoxication.

The lectures were evidently written two or three years ago, as some recent work on human and bovine tuberculosis, the causes of pyloric stenosis, and the ætiology of gastric ulcer, are not mentioned. On the whole, the book may be read with pleasure and advantage by the general practitioner as well as the pathologist. It is beautifully illustrated and got up with all the taste and exactness that characterise the Lippincott publications.

Nervous and Mental Diseases. By ARCHIBALD CHURCH, M.D., and FREDERICK PETERSEN, M.D. Pp. 940. With 350 Illustrations. Philadelphia and London: W. B. Saunders Co. 1914. Price 21s. net.

THIS is a very lucid text-book dealing with mental and nervous diseases. It starts with an excellent method of examining patients, and then deals with nervous and mental diseases in a systematic manner. The text is pleasant to read, and the numerous illustrations, mainly in the form of photographs, make the book still more readable. The symptoms of the various nervous diseases are clearly put, and much attention is paid to morbid anatomy; in each disease there is a useful paragraph on treatment.

The neuroses are particularly well treated and at greater length than is usual in a text-book. The mental section of the book is probably not so good as the nervous section, but this may be owing to the fact that much less space is given to it. The chapters on general etiology and treatment of insanity are extremely good and helpful, as is also the chapter on methods of examination of patients. It is curious that the exhaustive and infective psychoses are not dealt with at all. Korsakoff's psychosis is merely mentioned, but otherwise is untouched. In Chapter IX, under the heading of Paralytic Dementia, there is practically no mention made of the various chemical tests and of the microscopic examination of the cerebro-spinal fluid, now found so useful in diagnosis.

In short, this is a valuable text-book, and except that the mental disease section might have been more up to date, it is probably one of the best books of its kind that has yet been published.

Diseases of the Nose and Throat. By JONATHAN WRIGHT, M.D., New York, and HARMON SMITH, M.D., Cornell University. Pp. xii. + 683. With 327 Illustrations. London: Baillière, Tindall & Cox. 1915. Price 21s.

THE authors claim that the feature of this work is the great stress which is laid upon the etiology and pathology of diseases of the nose, pharynx, and larynx. The other aspects of rhinology and laryngology have, however, not been neglected. As is usual in American books, we get a full description of the "office outfit," and then a section upon direct laryngoscopy and bronchoscopy, including the newer suspension method. All aspects of the subject are very fully dealt with; for instance, the section on the nose begins with an account of the embryology and anatomy (macroscopic and microscopic), and includes the physiology of this organ before dealing with the acute inflammatory and other conditions. The authors have nothing very new to say with regard to the subject of colds in the head. The illustrations of the work are somewhat unequal, but the good ones are decidedly in the

majority. We are glad to notice that the work of British specialists has not been overlooked. In the chapter dealing with affections of the nasal septum a good deal of space is given up to the older operations which are now seldom or never performed; and in that on foetid atrophic rhinitis no mention is made of the researches of Perez, who claims to have discovered the causal organism of ozæna. The work is evidently intended for specialists, as it is considerably too long for students, and even for post-graduates, unless they are taking up rhinology and laryngology as a special subject—in fact, an excessive “wordiness” is the great objection to the present volume. A distinct feature of the book is a full description of affections of the buccal cavity, including the various forms of skin disease as they appear in this region. At times the descriptions of the pathological aspect of a subject appear to be unduly long; for instance, there are seven pages on the pathology of malignant growths in the larynx. Towards the end of the work are found chapters on tuberculosis and syphilis of the nose and throat, and on rhino-scleroma, and an account of the affections of the nose and throat in general diseases. The section on the nervous affections of the larynx contains a full account of the investigations into the nerve supply of the laryngeal muscles and the experimental work which has been done on the subject of laryngeal paralysis.

Local and Regional Anæsthesia. By CARROLL W. ALLAN, M.D. Pp. 615.
London: W. B. Saunders Co. 1914. Price 25s. net.

THIS large text-book was originally intended to be the conjoint production of Professor Matas and the author. Professor Matas, however, found himself unable to give the necessary time to its preparation, but the author has quoted liberally from the writings and drawings of his chief. The work presents a full survey of local anæsthesia as applied to major surgery in all regions of the body. It is comprehensive in its scope, for it includes experimental and theoretical considerations as well as eminently practical instructions. The historical side is also fully entered into.

After describing in detail the uses and dangers of a variety of local anæsthetics, the author goes on to give the different methods of application and the principles of his technique. Great detail is shown, and the clearness of the text is assisted by excellent diagrams. Chapters on Crile's anoci-association, intravenous, intra-arterial, and spinal anæsthesia are included; anoci-association is strongly advocated by Dr. Allen, but he does not recommend spinal anæsthesia.

Each region of the body is next taken up, and the method of local anæsthetic suitable for the various operations in each organ is clearly indicated. No region of the body, special sense organs included, seems to be unsuited for the use of local anæsthesia, and over 50 per cent. of all major operations, the author states, can easily be performed under

its influence. The last chapters are given over to intraneural injections of the different branches of the 5th cranial nerve, with the methods, dangers, and anatomical difficulties encountered in each division. There is a good index. Without doubt, we have here a standard work on local anæsthesia.

Anæsthesia. By JAMES TAYLOR GWATHMEY, M.D., and CHARLES BASKERVILLE, M.D. Pp. xxxii. + 945. With 283 Illustrations. London: D. Appleton & Co. 1914. Price 25s. nett.

DR. GWATHMEY'S position as a pioneer in the practical work of anæsthesia, coupled with the fact that American workers are contributing so largely to the development of the science and art of the subject, ensures a welcome for this handsome volume. A glance at the table of contents shows that there is no aspect which has been neglected, and while the older and well-tried methods are carefully considered, much attention is devoted to newer methods which are still evolving, and to such subjects as the nitrous oxide-oxygen-ether sequence. Intratracheal insufflation and anæsthesia by colonic absorption of ether are fully discussed.

While Dr. Gwathmey describes in detail his own views and technique, frequent and copious reference is made to the work of others. Moreover, the author has had the advantage of the collaboration of Dr. Charles Baskerville in dealing with the chemical side of the question, and chapters on such subjects as rebreathing, mental influence in anæsthesia, hypnosis in anæsthesia, and the medico-legal aspects of anæsthesia, have been contributed by writers specially qualified to speak regarding them.

We have thus presented to us a very complete and up-to-date exposition of the subject. There are numerous illustrations which enhance the value of a volume which can be recommended with confidence.

A Practical Handbook of Surgical After-Treatment. By ALAN H. TODD, B.Sc., M.S.(Lond.), F.R.C.S.(Eng.). Pp. 245. With 37 Illustrations. London: Edward Arnold. 1915. Price 4s. 6d. net.

THIS little book has apparently been written mainly for the use of the resident house surgeon. It is thoroughly practical in its arrangement and theoretical discussions have been almost entirely omitted. It is very complete, and leaves out nothing of any importance in connection with the after-treatment of ordinary surgical cases. The chapter on Massage perhaps does not yield very much information, being rather concerned with noting the indications for massage in after-treatment than in giving practical instruction as to methods. The style of the book, if not always faultless from a literary point of

view, is clear and dogmatic, and the methods advised are described in a simple and lucid manner. Although the class to which it belongs is already well supplied, we can recommend this as a sound and up-to-date practical guide to after-treatment.

Pasteur and After-Pasteur. By STEPHEN PAGET, F.R.C.S. Pp. 152. With 8 Illustrations. (Medical History Manuals.) London: A. & C. Black. 1914. Price 3s. 6d. net.

A BIOGRAPHY of Pasteur is a history of bacteriological applied science. As the author in the opening words of this book states, "It is not possible to measure, or to put into words, the value of Pasteur's work and the range of his influence. All attempts to estimate or explain him are mere foolishness." The general editor of the manuals, Dr. J. D. Comrie, is to be congratulated in his choice of author, who is the Honorary Secretary of the Research Defence Society. Inevitably the result is a telling vindication of research.

Writing of Pasteur's work on rabies the author reminds us it was on 6th July 1885 that he first used on man the protective treatment which he had proved on animals. There ought to be a calendar of the healing art to remind us of all such days. It is to be hoped the author will hand on his suggestion for the consideration of the Research Defence Society. It would be an effective leaflet.

The Chemistry of Colloids, and some Technical Applications. By W. W. TAYLOR, M.A., D.Sc., Lecturer in Chemistry at the University of Edinburgh. Pp. viii. + 328. With 22 Illustrations. London: Edward Arnold. 1915. Price 7s. 6d. net.

DR. TAYLOR'S *Chemistry of Colloids* is interesting as being the first general treatise on the subject to appear in the English language. The work is primarily intended as a text-book for the use of advanced students of chemistry, and accordingly a knowledge of physical chemistry and some familiarity with the chemistry of colloids is presupposed. At the same time the matter is so arranged and the results of the experimental data are so clearly set forth that the general worker interested in colloid chemistry cannot fail to find the book a useful one.

The author divides the treatment of his subject into three sections—the general properties of colloids (sols and gels); the methods of preparation; surface phenomena and adsorption; and adds a fourth section on application of colloid chemistry.

In the theoretical part the chapters of most interest to the student of medicine are probably that on the precipitation of colloids, in which a section is devoted to the reversible, partially reversible, and irreversible coagulation of albumin, and that on the protection and mutual precipitation of sols.

The instructions as to the various methods of preparation of colloids

are clear and explicit, and will be found useful by anyone desirous of preparing such solutions.

In the last section of the book the author deals with such problems as the application of colloid chemistry to the study of soils and the purification of sewage and water. A chapter is devoted to the biological aspects of colloid chemistry—the applicability of the adsorption formula to the equilibrium between blood and oxygen; the resemblance between enzyme action and that of metal sols; the colloidal aspects of agglutination and toxins and antitoxins; and the methods of determination of the osmotic pressure of biologically important colloids.

A large amount of experimental data and numerous illustrative and suggestive graphs add to the interest of the book.

Malay Poisons and Charm Cures. By JOHN D. GIMLETTE, M.R.C.S.
Pp. viii. + 127. London: J. & A. Churchill. 1915. Price
3s. 6d. net.

THIS little book consists, as the author modestly puts it, of notes prepared during eighteen years' service in the Federated Malay States, and they are based on materials furnished by friendly medicine men as well as on the writer's own observation. It is written partly from the medical, partly from the anthropological standpoint, and, frankly, is slightly disappointing. In Malay magic, like other primitive forms of magic, charms, spells, and poisons are used conjointly by the medicine man to attain his ends. Dr. Gimlette deals with these incantations and potions in his pages, but it is often difficult to say in a given instance whether the charm has any really poisonous character or whether it is merely a vehicle for the operation of sympathetic magic. There are, no doubt, great difficulties in the way of obtaining facts as to the comparatively ill-known flora of the country, and for this reason, probably, it is not always quite clear, when the poisonous properties of some of the plants are referred to, whether the alleged facts depend on actual observation or mere repute. From the purely anthropological standpoint, on the other hand, the notes are hardly more than a catalogue of the composition of poisons or philtres, and cannot be regarded as of great value in its present form, though doubtless it will serve as a basis for further observation. Some translations of Malay charms are also given. These criticisms are perhaps a little ungracious, considering the evident pains which Dr. Gimlette has taken to collect facts; the impression left by his book, however, is that he would have been better repaid by investigating a part of a large field more fully, either by giving some account of how these poisons are used, *i.e.* the spells which doubtless accompany them and the methods of the medicine man—facts which would be of value to the student of Malay folk-lore, or to have collected more definite facts

about the toxicology of the flora of the Malay States, concerning which at present there apparently is little exact knowledge. It must, however, be said that the author's investigations should prove both interesting and useful to those living in the Malay States, particularly to medical men, officials, and missionaries, whose work brings them in contact with native customs and prejudices, and doubtless Dr. Gimlette's work will find a welcome among them, although it does not make a strong appeal outside this circle.

A Campaign Against Consumption. By A. RANSOME, M.D., F.R.C.P., F.R.S. Pp. x. + 263. Ten Charts and Maps. Cambridge: The University Press. 1915. Price 10s. 6d. net.

DR. RANSOME'S name commands respect amongst all workers in the field to which he has devoted the untiring energies of a long lifetime. We venture, however, to question the usefulness of publishing a volume of prehistoric essays on various aspects of tuberculosis.

In a series of twenty-two papers we find that nearly one-third were written over twenty-five years ago, and only six during the present century. While fully admitting the part which Dr. Ransome has played as a pioneer in the anti-tuberculosis campaign, we cannot anticipate that perusal of the present collection of papers will materially assist in the successful conduct of that campaign or prove interesting save to those with a turn for archæological research.

The Inevitable Complaint: The Cure and After Cure of Consumptives. By HAROLD VALLOW, M.D. Pp. viii. + 66. London: John Bale, Sons & Danielsson, Ltd. 1915. Price 1s. 6d. net.

WE welcome Dr. Vallow's practical little book with its many useful suggestions. Too often the tuberculous patient is left to his own devices after his discharge from the sanatorium. Dr. Vallow shows how, under the supervision of a suitable "after-care" committee, a much larger proportion of sanatorium cures would probably be permanent.

The Dispensary Treatment of Pulmonary Tuberculosis. By HILDA CLARK, M.B., B.Sc.(Lond.). Pp. viii. + 279. London: Baillière, Tindall & Cox. 1915. Price 15s. net.

MISS CLARK belongs to the school of "intensive" dosage of tuberculin—a method that has not gained, in this country at least, the attention that it deserves. Into this book Miss Clark has put a great deal of solid work based upon practical experience. Detailed treatment and dosage are carefully given, and a very impartial survey of the principle of tuberculin administration is set forth. Special chapters are devoted

to the selection of cases for treatment, the co-ordination of dispensary, sanatorium, and domiciliary treatment being fully appreciated and discussed. Miss Clark's book is well worth perusal and study.

Students' Text-Book of Hygiene. By W. JAMES WILSON, M.D., D.Sc., D.P.H. Pp. x. + 263. With 26 Illustrations. London: William Heinemann. 1915. Price 8s. 6d. net.

DR. JAMES WILSON, who is Lecturer on Hygiene and Public Health at Queen's University, Belfast, has written a handy work on these subjects. It is based on the course of lectures which he has given during the past seven years, and which is specially designed for the requirements of students of medicine. The usual subjects are succinctly yet adequately treated, though one doubts the wisdom of including such subjects as the germ theory, elementary bacteriology, the mechanism of immunity, anaphylaxis, etc., in a short treatise on general hygiene when they are more properly discussed in works of pathology.

The author writes in a pleasant and easy manner, and it affords one pleasure as well as instruction to read such chapters as school hygiene, industrial hygiene, etc. Even the dry subject of vital statistics makes interesting reading. Dr. Wilson has found space for a very acceptable chapter on heredity and eugenics, and concludes it with the pious (though, perhaps, too optimistic) hope "that the present crusade against the white plague may lead to its extinction in this country."

A Text-Book of Radiology. By EDWARD REGINALD MORTON, M.D., C.M., F.R.C.S. Pp. xvi. + 221. With 26 Plates and 72 Illustrations. London and Glasgow: Henry Kimpton. 1915. Price 7s. 6d. net.

THIS small volume contains a very clear account of a large amount of careful work. For a book of its size, it is most concise, beautifully illustrated, and abounding with useful information. It bears throughout the impress of the author's wide personal experience and acute observation. Its outstanding features are those chapters dealing with the care and proper use of X-ray tubes, the interpretation of radiographs, the localising of foreign bodies, and the employment of bismuth in examining the digestive system.

In his preface Dr. Morton refers to the concluding chapter on X-ray therapeutics, which he presents with a feeling of diffidence. In this we feel he need have no qualms of conscience. His step is a move in the right direction, and is to be welcomed: for in medicine, at present, our powers of diagnosis are often excellent, but when we come to treatment, it is there we want help.

NEW EDITIONS.

The Alimentary Tract: A Radiographic Study. By ALFRED E. BARCLAY.
Second Edition. Pp. 169. With 77 Illustrations. London:
Sherratt & Hughes. 1915. Price 15s. net.

WHILST appearing under a new title—adopted to include the wider field covered by it—this valuable contribution is, in fact, a revised and enlarged edition of a volume entitled *The Stomach and Oesophagus*, published by Dr. Barclay in 1913, which must be familiar to many of our readers.

In the present edition the whole of the alimentary tract is dealt with, though, as might be expected, the greater part of the book is devoted to the consideration of the stomach and duodenum.

In the opening pages the technique of the opaque meal and radiographic method of examination, as practised by Dr. Barclay, is clearly and carefully explained, and this section should prove useful to those who are beginning this line of work. We are surprised, however, to find that Dr. Barclay depends almost entirely on his observations with the screen for the conclusions he draws. "Pretty pictures" are not everything, we admit, but we do think that the best results can only be obtained by a combined radioscopic and radiographic examination: in stout people particularly, in whom we are more likely to find indications of *early* disease, and in whom screen examinations are most disappointing, a series of plates is of the greatest value, and, in addition, we think that both the patient and the surgeon have a right to expect some more tangible guide than a mere description of what has been seen by the radiologist, and this can, in the majority of cases, be supplied in the form of a plate or plates.

In the succeeding chapters the oesophagus and stomach are very carefully considered, and many important questions, such as the causation of gastric ulcer and "hour-glass" stomach, both organic and spasmodic, are dealt with in so interesting and lucid a manner, that we look forward to meeting such cases in the future, armed with many fresh ideas, for Dr. Barclay does not content himself with a narrative of what he has seen, but propounds theories which sound as if they must be right, and in all probability are right. The chapter on the large intestine has admittedly been put together somewhat hurriedly, but is none the less well worth careful study. With regard to constipation, in our experience cecal stasis has been a much more frequent cause than rectal stasis or dyscrasia; the reverse, however, has been the case in the author's experience.

Dr. Barclay finds occasion to protest strongly against the "wholesale removals" of the large intestine, but we are glad to say that we have noticed no tendency on the part of surgeons to adopt these

measures without most careful consideration and with a due sense of responsibility. Many of the caeca we have seen removed were positively crying out for removal, and were certainly very different in appearance and structure and, judging from the clinical history, in function from what they were meant to be by the "Great Architect" when He laid down the original plan.

The volume concludes with a useful Table of Cases, which gives the clinical diagnosis, the X-ray findings, and the operative findings, which should prove useful; a complete bibliography, and, we are glad to say, an index.

We heartily recommend this book to all who are interested in the subject it deals with, and we would, in conclusion, offer a word of praise to the publishers who have placed in our hands a book which is pleasant to read, one in which the illustrations are very good indeed, and which is marvellously cheap.

Clinical Diagnosis: A Manual of Laboratory Methods. By J. C. TODD, Ph.B., M.D. Third Edition. Revised and enlarged. Pp. 585. With 209 Illustrations. Philadelphia and London: W. B. Saunders Co.

THIS book is devoted to the more important laboratory methods which have clinical value. An introductory chapter dealing with the use of the microscope deserves special mention.

In a recent address to the Royal Microscopical Society Professor Sims Woodhead said that "if we could only turn some 20 or 30 of our members into the various medical schools of the kingdom" to instruct in the finer working of the modern microscope, "the rate of medical knowledge would be enormously speeded up." Certainly, when one thinks of the disregard of many of the simplest principles of microscopy constantly to be seen in hospital side-rooms and even in research laboratories, one cannot but feel how much instruction such as Dr. Todd gives in his introductory chapter is called for as an essential part of the medical student's curriculum. Most things of importance in the manipulation of the microscope are here carefully and clearly explained. The entire dependence of the microscopic image on the aperture as distinct from the mere magnifying power of the objective, and the consequent uselessness of mere "empty magnification," is well brought before the student's mind. Abbe's formula for the limits of useful eye-piece magnification is given. The importance of maintaining correct tube length—a subject which receives surprising neglect in laboratories—is fully explained; as is also the effect of variations in cover-glass thickness and the means for their correction. The proper use of the iris diaphragm and of central oblique and dark-ground illumination is explained on a rational basis. One cannot agree with the recommendation to use the concave side of the mirror when

working with an immersion lens and artificial light: and among the various illuminants one would like to put in a plea for mention of the oil lamp. For much of the highest kind of critical work with immersion lenses and modern condensers the *edge* of an oil lamp flame still possesses many advantages of its own. Instructions are given for obtaining critical light, and the importance of centring the condensor is insisted on; but as no mention is made of the distinction between the total aperture of the condensor and its aplanatic aperture, the student will scarcely understand the formation of a "critical image," as that term has always been employed by leading English writers on the microscope. As he is told that the condensor should have an N.A. equal to that of the objective, he might readily suppose that when he focuses the light through an Abbé condensor of N.A. 1.2 or 1.4 he is using the whole of the N.A. of his objective of N.A. 1.3. But it is well known that it has not yet been possible to construct a lens of high N.A. which will permit the use of an unbroken ("aplanatic") cone of light of much more than three-quarters its own N.A. An Abbé condensor can be used in focus with the iris fully open, because, while its total N.A. is very high, its aplanatic N.A. is relatively low. For the production of a "critical" image with an immersion lens, in the strict sense of the term, some form of aplanatised condensor is required.

In our opinion, if a paragraph were inserted explaining the distinction between total and aplanatic aperture and the use of corrected condensers generally, the value of this excellent part of the book would be much increased. Its appearance is of good omen for medical microscopy. We believe that there is much value in the suggestion the author makes that the student should practise the use of his instrument on such specimens as diatoms. There can be no doubt that in trying to resolve their finer markings he will be forced to the correct use of his instrument in a way he may easily escape from if his practice is confined to stained specimens.

There are comprehensive chapters on the examination of urine, stomach contents, faeces, parasites, etc. The unreliability of the hypobromite method for the estimation of urea is insisted on.

The chapter on blood examination is on the whole very well done. Reference might be made to Haldane's haemoglobinometer and to Pappenheim's beautiful combined methods of staining.

One cannot, on the whole, agree with the advice to differentiate megaloblasts from normoblasts by attending mainly to their size. As has been said, "the nucleus is the heraldic sign of the cell." In describing nucleated red cells, it would be well if reference were made to the tendency of their nuclear chromatin to radial arrangement. The lymphoidocyte is not described. One has often felt that a student's understanding of blood-cells would be simplified and his

interest quickened if the subject were treated more from the standpoint of development.

Dr. Todd concludes his manual with a chapter on sero-diagnostic methods. We would congratulate him on the production of a text-book which is very comprehensive and clearly written, and likely to prove of much use to students and practitioners. The author is careful not to claim exaggerated importance for any of the methods he describes. There is a good index.

Insanity in Everyday Practice. By E. G. YOUNGER, M.D.(Brux.), M.R.C.P.(Lond.), etc. Third Edition. Pp. x. + 130. London: Baillière, Tindall & Cox. 1914. Price 3s. 6d. net.

THERE is no department of medical practice where more sudden and perplexing problems arise, or where more prestige is lost by the practitioner who fails to deal aright with them, than in that dealt with here. An "outline chart," as the author terms it, will be welcome to many who have not time to master a larger work. The subject is treated in a thoroughly practical way; the hints given as to examination of a patient are sensible and well expressed; and the legal aspects of the subject are explained, including the Mental Deficiency Act of 1913. The various "types" and "special forms" of insanity are clearly though shortly described; and if the classification is not quite logical, it is supported by the authority of the familiar and official "Nomenclature of Disease." Treatment is only dealt with so far as it is practicable for the general practitioner to carry it out.

We can recommend the volume to those who desire an introduction to the subject. It is interesting to learn that it has been translated into Chinese.

Treatise on Anatomy. By Sir HENRY MORRIS. Fifth Edition, edited by C. M. JACKSON, M.S., M.D. Pp. 1539. London: J. & A. Churchill. 1915. Price 30s. net.

THE fifth edition of this book has undergone a considerable amount of re-writing and re-arranging, and the result is well up to the high standard set by previous editions. Owing to the retirement of Sir Henry Morris and Professor M'Murich the work of editor has been undertaken by Professor C. M. Jackson of Minnesota. In the authors of the various sections a few changes are apparent in the present edition, the relative proportion of British and American writers, however, remaining much the same. The name of Professor David Waterston appears for the first time as the author of the section on Special Sense Organs.

The use of the B. N. A. terminology, more or less Anglicised, has been continued, and is undoubtedly proving a great boon on both sides of the Atlantic. This will be readily recognised when it is remembered

that some 30,000 anatomical terms have been reduced to 5000, not to mention the many other advantages of the system.

In this edition an attempt is made to assist the student commencing anatomy by indicating the fundamental facts in large type, while details which are unnecessary in the meantime are printed in smaller type. This method is very successful on the whole, but in the section on Morphogenesis it has been rather overdone, the "fundamental facts" here having been reduced to a minimum which cannot convey much intelligible information to the student. The whole of this section is somewhat sketchy and disconnected in character. The descriptions of the lymphatic and nervous systems by Eliot R. Clark of Johns Hopkins University, and Professor Irving Hardesty of Tulane University, respectively, are both exceedingly comprehensive and well written, and call for special praise.

The illustrations of this volume form the least satisfactory feature, and fall considerably below the high level which one expects in the modern text-book of anatomy. This is notably the case in the section on Articulations, but many of the other original figures are poor.

Text-Book of Public Health (late Husband's). By E. W. HOPE, M.D.,
D.Sc. Eighth Edition. Edinburgh: E. & S. Livingstone.
1915. 5s. net.

ONE welcomes this volume, since it is an old friend in a comparatively new garb. Formerly the subject of forensic medicine was incorporated, but the expansion of public health as a study has compelled the separation of the two. Consequently the volume before us only deals with public health. The book is strong in parts, and weak in others, and, strange to say, the defects exist where Dr. Hope is known to be actually strongest. Under smallpox one looks in vain for the results of Dr. Hope's experience in aerial diffusion. The point is dismissed in a few words when in point of fact the student should be fully enlightened. Disinfection, too, is very lightly treated. Sanatoria require much more than 19 lines. Sanatoria are now clamant problems, more especially as regards cost of erection and administration. Under sanitary law one observes that the Scottish student has not been catered for at all. This rather interferes with the value of the book. Under the Factory and Workshop Act no mention is made of the provisions applied to laundries, which are important. The Public Health (Milk and Cream) Regulations have been modified, but the modifications are not mentioned. Taking into consideration the fact that new legislation for the milk traffic will come into operation in October, it is surprising that no mention has been made of the fact. Dr. Hope has scarcely given us a book sufficiently advanced for the present-day requirements of the candidate for a Public Health diploma.

NOTES ON BOOKS.

REPORTS, TRANSACTIONS, ETC. — The *Ninth Report of the Henry Phipps Institute* (Philadelphia, 1915) consists of a number of papers on tuberculosis by the workers in the Institute. They have already appeared as records of original research in special journals, and are presented here in convenient form. The *Eighth Report* deals with one subject only—"Factors Affecting the Health of Garment Makers"—and is an exhaustive study by Dr. H. R. M. Landis and Miss Janice S. Reed.

Posological Tables, by William Craig (Fourth Edition), pp. 132 (Edinburgh: E. & S. Livingstone, 1915), price 1s. A new edition of this well-known booklet appears appropriately on the heels of the new British Pharmacopœia. In addition to the familiar tables on doses, actions, and forms of administration of medicines, it also contains tables showing the important alterations effected by the Pharmacopœia; a list of the chief incompatibilities; an appendix on poisons; and an index of diseases with their most important remedies. It is a handy pocket-book epitome for student and practitioner.

Dr. Nash deals with *Evolution and Disease* (Bristol: John Wright & Sons, Ltd., price 2s. 6d. net), mainly from the historical standpoint, and gives in small compass a great deal of information as to epidemics in ancient and modern times. His later chapters, more biological and bacteriological, are, in places, of a somewhat speculative character, but bear witness to much thought and study. Altogether a very interesting book, adapted for lay as well as medical readers.

To write a little book on hygiene so short as to be suitable for nurses, and yet free from triviality, is not very easy, but Dr. F. J. Smith has succeeded admirably. His *Domestic Hygiene for Nurses* (London: J. & A. Churchill, price 2s. 6d. net), of which the second edition has just appeared, contains all the elementary facts about water, ventilation, cleanliness, clothing, exercise, etc., which a nurse ought to know. It does not err by seeking to include too much, and is well adapted for the class of students to whom it is addressed.

BOOKS RECEIVED.

ALBUTT, SIR CLIFFORD. Diseases of the Arteries, including Angina Pectoris. In Two Volumes	(Macmillan & Co., Ltd.)	39s.
BROOKE, G. E. Aids to Tropical Medicine. Second Edition	(Baillière, Tindall & Co.)	3s.
BUCHANAN, R. J. M. Text-Book of Forensic Medicine and Toxicology. Eighth Edition. (E. & S. Livingstone)		—
CESHNY, A. R. A Text-Book of Pharmacology and Therapeutics. Sixth Edition. (J. & A. Churchill)		15s.
INDEX of Prognosis and End-Results of Treatment. Edited by A. Rendle Short. (J. Wright & Sons, Ltd.)		21s.
LELEAN, P. S. Sanitation in War	(J. & A. Churchill)	5s.
LENZMANN, R. Emergencies in Medical Practice	(Baile, Sons & Donaldson, Ltd.)	21s.
M'DONAGH, J. E. R. The Biology and Treatment of Venereal Diseases. (Harrison & Sons)		—
TRANSACTIONS of the College of Physicians of Philadelphia, 1914. Vol. XXXVI. (Philadelphia)		—

EDINBURGH MEDICAL JOURNAL.

EDITORIAL NOTES.

Midwives' Bill for Scotland.

AN influentially signed Memorial has been presented to the Right Hon. T. McKinnon Wood, H.M. Secretary for Scotland, and to the Lord President of H.M. Privy Council from representatives of the Medical Faculties of the Universities, the Royal Medical Corporations, and the Medical Officers of the Maternity Hospitals in Scotland, strongly urging the Government to pass without delay a Midwives' Bill for Scotland. The signatories include the Presidents of the Royal College of Physicians, Edinburgh, the Royal College of Surgeons, Edinburgh, and the Royal Faculty of Physicians and Surgeons, Glasgow; the Deans of the Faculties of Medicine, and the Professors of Midwifery of the four Scottish Universities; the Medical Officers of Health of Edinburgh and Glasgow; and the representative Medical Officers of the Scottish Maternity Hospitals.

It is pointed out in the Memorial that the need for a Midwives' Bill was unanimously expressed by the medical and nursing professions in Scotland last year; that the private members' Bill on the subject (which passed through the House of Lords) was dropped in the House of Commons mainly for want of time at the end of a busy session. Since then a situation of very grave urgency has arisen out of the war. A large number of medical practitioners have been called away for war service. The result of this is that it will be impossible for those practitioners who still remain to overtake all the attendance on midwifery cases that is necessary. A large amount of midwifery practice will therefore of necessity fall into the hands of midwives and unqualified women. These persons, many of them absolutely untrained, are *under no such official or medical supervision* as is provided in England.

The situation constitutes, in the opinion of the memorialists, a national emergency, and calls for an immediate remedy, which they believe is only to be found in the enactment of a Midwives' Bill for Scotland similar to the Bill of last year.

The need for such a Bill was already great, independently of the present war conditions. The war has, however, made this need a

most pressing one, and it will continue to exist for many years to come owing to the depletion of medical practitioners throughout the country.

In favour of taking immediate action, the signatories further urge the recent precedent by which the Notification of Births Act was by special legislation made applicable to the whole country in order to meet a national emergency arising out of the war conditions. This measure will fail of its full beneficial effect in Scotland unless it is supplemented by the Midwives Act, for which they desire to plead.

At various conferences which have recently been held throughout Scotland in connection with the Maternity Hospitals and the Approved Societies under the National Insurance Act, the need for a Midwives' Bill has been strongly urged, and resolutions in favour of its introduction and speedy enactment have been unanimously carried.

It is to be hoped, therefore, that this much-needed measure will speedily pass through Parliament as an unopposed Government Bill.

A Preventive Antiseptic Field Dressing.

THE prospects of another winter campaign in the highly-cultivated area of Flanders brings with it the fear that the surgical experiences of last winter may be repeated, unless some means can be devised to deal with the peculiar forms of wound-infection which characterised the earlier phases of the war. To many of us the prevalence of gas gangrene and tetanus among the wounded from this field of hostilities came as a painful surprise, and most of the surgical officers of all the armies engaged made their first acquaintance with forms of septic infection which had been temporarily abolished from surgical practice by the work of Lister. The so-called aseptic measures and the attenuated forms of antiseptic agents on which we had come to rely in civil surgery failed to meet the new conditions, and many lives were endangered, and not a few were lost, while we were groping to find some plan of dealing efficiently with the unfamiliar infections so universally met with in wounds sustained on the field. Old controversies were renewed, and the respective claims of carbolic acid, corrosive sublimate, iodine, peroxide of hydrogen, and how many other antiseptic agents, were debated afresh, without, it must be confessed, any very useful conclusion being reached—as Tuffier has remarked, “the old antiseptics had gone bankrupt.” Under the advocacy of Sir A. E. Wright the hypertonic salt dressings, with their resultant lymph lavage, obtained an extended trial, and met with a limited measure of success. The main problem, however, had not been solved, and a means of destroying not only organisms, but also their more resistant spores, before they had time to become active in the tissues, had to be found.

To this end Professor Lorrain Smith and his colleagues, including

Professor A. Murray Drennan (University of Otago, New Zealand), Dr. Theodore Rettie, and Lieutenant Wm. Campbell, R.A.M.C., have directed their attention, and the results of an investigation carried out in the Department of Pathology of the University of Edinburgh, at the request of the Medical Research Committee, lead us to hope that such an agent has been discovered.

The problem they set themselves was to find an agent which could be relied upon to prevent sepsis, and which could be applied as a first dressing on the field. Attention was first directed to the hypochlorites, and as it was found in the course of the investigation that hypochlorous acid is a more potent germicide than its salts, means were devised of employing the free acid as an antiseptic agent, either in the form of a gas or as a solution in water. A powder—"Eupad"—composed of equal weights of chloride of lime and powdered boric acid, when moistened with a small quantity of water, furnishes the antiseptic in a gaseous form. Treated with a large quantity of water (25 grams per litre) and filtered, this powder forms a solution—"Eusol"—which contains approximately 5 per cent. hypochlorous acid. (For the benefit of etymologists it may be mentioned that the first syllable of these names is derived from the initial letters of "Edinburgh University"; the termination, "pad," is a fanciful contraction for "pathological department," while "sol" explains itself.) The ingredients being easily procurable, portable, and inexpensive, and the preparation of the antiseptic agent, involving, as it does, only the addition of a quantity of water, being so simple, we have in Eupad an ideal antiseptic for use in a field dressing.

The experimental evidence on which the efficacy of this antiseptic rests is fully detailed in a paper published in the *British Medical Journal* of 24th July, as well as the results of certain clinical observations which go to confirm the laboratory findings. A comprehensive clinical investigation is now being carried on to test the applicability of this agent to varying conditions of surgical work, the results of which will be published in due course. We are not anticipating this report when we say that already there is considerable evidence to show that we are in possession of a means which bids fair to supply the want so acutely felt last winter.

Military Appointments. WE note with much satisfaction the selection of two members of the Edinburgh School for important posts with the British Expeditionary Forces—Professor G. Lovell Gulland has been appointed Consulting Physician to the Forces in the Mediterranean, and Professor Alexis Thomson, Consulting Surgeon to one of the British Armies in France. Both officers hold the temporary rank of colonel.

CASUALTIES.

KILLED in action in the Dardanelles on 14th July, Major DAVID ROBERT TAYLOR, R.A.M.C., 4th Batt. King's Own Scottish Borderers.

Major Taylor was educated in the Edinburgh School, and after qualifying in 1893 settled in practice in Ayton in Berwickshire.

KILLED in action in the Dardanelles on 12th July, Captain ANDREW WALLACE, 4th Batt. King's Own Scottish Borderers.

Captain Wallace graduated M.B., C.M., in Edinburgh University in 1896, and has practised in Coldstream for about fifteen years. He held a combatant commission in the King's Own Scottish Borderers for twelve years.

KILLED in action in Flanders, Lieutenant GEORGE M'CALLUM, R.A.M.C., attached to 6th Duke of Cornwall's Light Infantry.

Lieutenant M'Callum graduated M.B., Ch.B., in Glasgow University in 1914.

KILLED in action in Flanders, Lieutenant JOHN CORNOCK HAWKES, R.A.M.C., attached to the 8th Batt. King's Royal Rifle Corps.

Lieutenant Hawkes obtained the Scottish triple qualification in 1910.

DIED of wounds in the Dardanelles, Lieutenant JOHN CATTANACH, R.A.M.C.

Lieutenant Cattnach graduated M.B., Ch.B., in Edinburgh University in 1912. In addition to being a distinguished student, he was an exceptionally fine all-around athlete, and for some years was considered the best shinty player in Scotland.

KILLED in the Dardanelles, Captain JAMES JOHNSTONE DYKES, 1/5 Batt. King's Own Scottish Borderers.

Captain Dykes obtained the Scottish triple qualification in 1911. He was a member of the staff of the Dumfries and Galloway Royal Infirmary, and held a combatant commission in the King's Own Scottish Borderers.

THE following students of medicine of Scottish schools have appeared in recent casualty lists:—

Second-Lieutenant J. S. STEWART, 5th Batt. Argyll and Sutherland Highlanders, killed in the Dardanelles. (University of Glasgow.)

Lieutenant R. M. STEWART BOYD, 6th Batt. Highland Light Infantry, killed in the Dardanelles. (University of Glasgow.)

Second-Lieutenant THOMAS BAILLIE ERSKINE, 4th Batt. Argyll and Sutherland Highlanders, attached to the Gordon Highlanders, killed in Flanders. (University of Glasgow.)

CLINICAL STUDIES. VI.—LESIONS OF THE OCCIPITAL LOBE AND AFFECTION OF VISION.

By BYROM BRAMWELL, M.D., F.R.C.P.E., LL.D., F.R.S.E., Consulting Physician, Royal Infirmary, Edinburgh; Physician, Chalmers Hospital, Edinburgh.

FOUR ACUTE CEREBRAL ABSCESSSES—TWO IN THE LEFT OCCIPITAL LOBE, ONE IN THE RIGHT OCCIPITAL LOBE, ONE IN THE RIGHT MOTOR AREA (UPPER PART); MARKED CONSTRICTION OF THE FIELDS OF VISION, THE FUNDI OCULI BEING NORMAL.

BILATERAL lesions in the occipital lobes are very rare. Another case, in addition to the case recorded in the June number of this *Journal*, occurred in my hospital practice a few years ago. In it an acute abscess was present in each occipital lobe; in it, too, marked constriction of the peripheral fields of vision was present. There were no changes in the fundus to account for this condition. But I do not wish to lay too much stress upon this point in this particular case, for the dull mental condition of the patient made it perhaps difficult to be sure of the exact accuracy of the perimeter observations. The notes of the case are as follows:—

A man, aged 34, was admitted to the Edinburgh Royal Infirmary on 4th May 1909 complaining of intense headache, dimness of vision, and loss of power in the left arm; he died five days later.

The *history* of the case was, from a diagnostic point of view, very misleading.

Two and a half years previously, while in Sierra Leone, the patient had very severe and persistent frontal headache, worse at night, and preventing sleep. Malaria and sunstroke were thought to be the cause of the headache. Notwithstanding treatment the headache continued for three months; then the military doctor who attended him removed two small lumps on the right parietal bone at its junction with the frontal bone. A few days after the operation his legs became so weak that he was unable to walk. A week after the operation the headache had entirely disappeared. In the course of three weeks the legs began to recover, and ultimately got quite well. The patient was then invalided home and admitted to the military hospital at Woolwich.

While at Woolwich the headache returned, and loss of power developed in the left arm and leg. In the course of two months

the left hemiplegia was recovered from ; he was then sent home to Edinburgh.

For a year after his return to Edinburgh he remained quite well, free from headache and other symptoms. During this time he acted as a ticket collector in the Empire Theatre ; subsequently he was employed in a brewery.

About six months ago he had influenza ; this was followed by a cough, which continued until the present illness commenced. Some months ago he spat a considerable quantity of blood, and for some months past he has been bringing up a good deal of thick yellow sputum.

Before the headache commenced, two and a half years ago, he was a very healthy man. He denied having had either syphilis or gonorrhœa.

History of the Present Attack.—On Thursday, 29th April, he had slight headache ; on Friday, 30th April, while at work, the headache became very severe—it was the same sort of headache, he said, as he had previously suffered from. About 11 A.M. on Friday, 30th April, he noticed that his eyesight was getting dim and that objects seemed to move round him. His sight got rapidly worse, and he had to give up work ; he managed to walk home, went to bed, and remained in bed for the next four days, *i.e.* until he was brought to the Infirmary. On the morning of Saturday, 1st May, he noticed, when he woke, that his left arm was very weak.

Family History.—Unimportant ; the patient, married, had had no children ; his wife had not had any miscarriages.

Condition on Admission to Hospital.—Healthy-looking man, face well coloured ; height, 5 ft. 11 ins. ; weight, 12 st. 6½ lb. ; temperature, 96° ; pulse, 84 ; respirations, 36.

Intense headache ; pain felt in the frontal and parietal regions, on both sides of the head, very severe at night, preventing sleep. No vomiting. Patient had a dazed look and constantly pressed his hands to his forehead ; the brow was wrinkled.

The left arm was partly paralysed ; it could not be raised against slight resistance ; it was flaccid. Dynamometer, right hand = 80, left hand = 30.

No paralysis in the left leg. Knee-jerks and Achilles-jerks equal and active ; slight, but not sustained, ankle-clonus present on both sides ; plantar reflex on each side flexion. The arm-jerks were equal on the two sides and not exaggerated.

No loss of sensation in any part of the body.

Pupils equal in size, 2 mm. in diameter ; they contracted to light and on convergence.

Vision was markedly impaired ; the patient could count fingers at 8 feet. The visual fields were much constricted ; a perimeter chart made

by myself three days after the patient's admission to hospital, when he was stupid and dazed, showed great constriction of the fields (see Fig. 1).

The optic discs were normal, and remained so up to the time of the patient's death.

No signs of cranial nerve paralysis; ocular movements normal; no nystagmus.

Hearing somewhat impaired in the right ear—whether this was a recent or an old condition could not be determined; examination of the ear showed no disease.

Urine was normal; some bronchitic râles over both lungs; no local lung lesion detected; heart normal.

Diagnosis.—The history of the case prior to the present attack was,

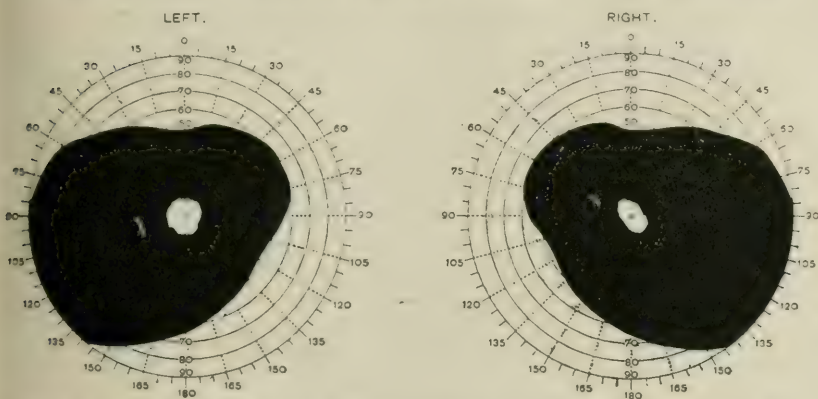


FIG. 1.—Perimeter Chart in the Case of Bilateral Abscess in the Occipital Lobes described in the Text, showing Marked Constriction of the Fields of Vision.

notwithstanding the patient's denial, highly suggestive of syphilitic brain disease. A lumbar puncture, made two days after the patient's admission to hospital, strongly confirmed this diagnosis; it showed 200 lymphocytes to the field (450 diameters).

Treatment.—Iodide of potassium (30 grains, three times daily); an ice-bag to the head; and large doses of phenacetin for the headache.

Subsequent Progress of the Case.—The ice-bag gave some relief, but the patient rapidly became worse. On 7th May he vomited several times. On 8th May much more lethargic, roused with difficulty; could only count fingers at a distance of one foot; headache very intense; tongue heavily furred, breath very offensive. On 9th May very flushed; lips and cheeks cyanosed; breathing very stertorous; pupils insensible to light.

Again lumbar-punctured; no increased pressure; cerebro-spinal fluid turbid; microscopical examination showed a large leucocytosis.

The patient died on 9th May at 12.15 P.M.

During the whole course of the case no paralysis was observed in the left leg. During the five days the patient was under observation in hospital the temperature was subnormal; it rose to 102.2° just before death (see Fig. 2).

Post-mortem examination made by Dr. J. D. Comrie on 10th May; permission limited to the head.

Skull cap very thick and unusually hard; dura mater adherent to the skull, and to the surface of the brain, over the upper part of the posterior end of the first right frontal convolution.

Over the pons Varolii, in the interpeduncular space, and round the

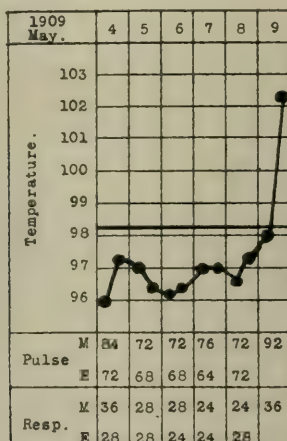


FIG. 2.—The Course of the Temperature, Pulse, and Respirations in the Case of Bilateral Abscess in the Occipital Lobes described in the Text. Until just before death, when it rose to 102° F., the temperature was subnormal and the pulse frequency not increased.

optic nerves a thick layer of viscid pus. Cultivation gave a copious growth of pneumococci, some colonies of staphylococci, and one or two colonies of a short bacillus showing bipolar staining, which, however, could not be subcultured (probably Friedländer's pneumobacillus).

Left hemisphere of the brain looked larger than the right; convolutions flattened and sulci effaced, particularly over the left hemisphere.

On section of the brain, after injecting the ventricles with gelatine and hardening in formalin, four acute abscesses were found.

Two abscesses in the centre of the left occipital lobe (see Fig. 3): the brain tissue surrounding these abscesses was in a condition of acute inflammation and studded with minute hæmorrhages; the pus from one of these abscesses had made its way into the lateral ventricles, from

which it (the pus) had escaped to the base of the brain through the locus perforatus posticus.

A third small abscess, about the size of a cherry, in the white matter of the right occipital lobe (see Fig. 3).

A fourth abscess, about the size of a walnut, in the upper part of the right ascending frontal convolution (see Fig. 4).

Beneath the adherent dura mater (over the posterior end of the first right frontal convolution) the remains of an old gummatous lesion (see Fig. 5).

The retinae, optic nerves, optic tracts, and visual cortex were absolutely normal to the naked eye.



FIG. 3.—Transverse Vertical Section through the Occipital Lobes in the Case of Bilateral Abscess described in the Text (seen from the front).

A large abscess, which has destroyed the greater part of the white matter, is seen in the left occipital lobe; the brain tissue round this abscess was inflamed and infiltrated with minute punctiform hemorrhages.

A small abscess about the size of a cherry is situated in the white matter of the right occipital lobe.

Remarks.—The case is one of great clinical interest. The diagnosis was very difficult.

The history prior to the present illness was highly suggestive of syphilitic brain disease—the patient, a soldier, had suffered for some months from severe headache, worse at night; two superficial nodes had been removed from the exterior of the skull; subsequently the headache returned and left hemiplegia developed; this passed off under treatment, and the patient remained well for eighteen months; then the present attack commenced with severe headache and dimness of vision. The first examination of the cerebro-spinal fluid showed a very large lymphocytosis.

The patient denied syphilis and gonorrhoea, but the post-

mortem examination showed the remains of an old syphilitic gumma, verified by microscopical examination, on the surface of the right frontal lobe (see Fig. 5).

It was reasonable to conclude that the acute head symptoms which developed on 30th April were probably due to the same cause as the previous symptoms, *i.e.* syphilis. This opinion was confirmed by the first lumbar puncture, which showed a very marked lymphocytosis.

The facts (1) that the symptoms were not relieved by large doses of iodide of potassium, and (2) that the second lumbar puncture, made just before death, showed a large leucocytosis,

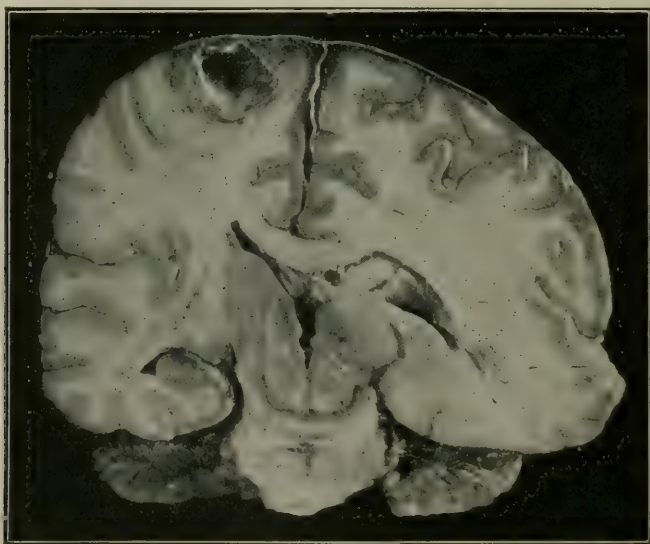


FIG. 4.—Transverse Vertical Section through the Brain in the Case of Bilateral Abscess in the Occipital Lobes described in the Text (*seen from the front*). An abscess about the size of a walnut is seen in the upper part of the right motor area.

suggested an acute non-syphilitic inflammatory lesion involving the membranes.

The *post-mortem* examination showed a purulent basilar meningitis and four acute abscesses in the brain—two in the left and one in the right occipital lobe (see Fig. 3); the fourth abscess was situated in the upper part of the right motor area (ascending frontal convolution) (see Fig. 4).

The diagnosis of abscess of the brain, when there is no apparent cause for the abscess—no apparent local source of septic infection (in the ear, nose, skull bones) and no apparent source of

distant infection, such as a septic focus in the lung, which, next to a local source of infection, is by far the most common cause of brain abscess—can never be made with any certainty. Under such circumstances one may suspect an abscess, but one is not justified in definitely diagnosing it.

In this particular case we were unfortunately not allowed to examine the lung post-mortem; but for six months prior to his death the patient had suffered from cough and spit, and on one occasion had brought up a large quantity of blood; presumably, therefore, there was a local lesion in the lung capable of acting as a source of septic infection.

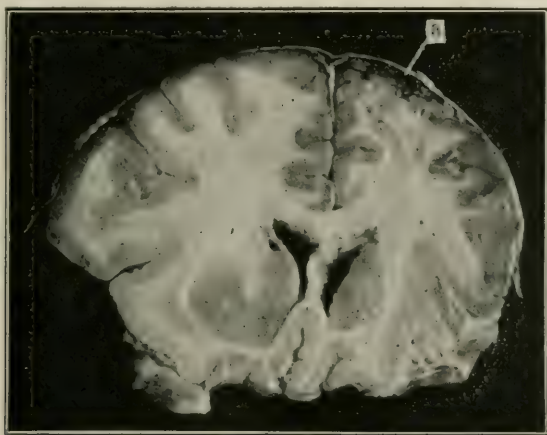


FIG. 5.—Transverse Vertical Section through the Frontal Lobes in the Case of Bilateral Abscess in the Occipital Lobes described in the Text (seen from behind).

The letter *a* points to the posterior end of the first right frontal convolution, over which the dura mater was adherent; between the adherent dura and the brain substance there are the remains of an old gummatous lesion.

The subnormal temperature (see Fig. 2) was an important point in the case; for one of the most characteristic clinical features of brain abscess, after the initial onset, is a subnormal or normal temperature.

In this case the absence of pyrexia until just before death is especially noteworthy, seeing that there was well-marked purulent basilar meningitis.

Another point of interest is the fact that an abscess the size of a walnut was situated in the upper part of the right motor area (top of the ascending frontal convolution), and that the paralysis involved the left arm, not the leg. Possibly during the last two or three days of the patient's life the leg may have been in some

degree paralysed without the paralysis being detected; but at the time of the patient's admission to hospital there was certainly no paralysis of the leg.

The dimness of vision developed suddenly and did not depend upon optic neuritis. I myself examined the optic discs on 6th and 7th May, and confirmed the statement that there was no optic neuritis.

The marked constriction of the fields of vision is of interest in connection with the remarkable case which I recorded in the June number of this *Journal*.

The case shows the great diagnostic value of lumbar puncture. The first lumbar puncture showed a very marked *lymphocytosis*—a condition highly suggestive of syphilitic nerve disease; the second lumbar puncture a marked *leucocytosis*—a condition suggestive of an acute non-syphilitic inflammation of the meninges, which was in fact present.

MITRAL STENOSIS; SUDDEN PARTIAL LOSS OF CONSCIOUSNESS;
MENTAL STUPOR AND MIND-BLINDNESS FOR A FORTNIGHT;
PERMANENT RIGHT-SIDED HOMONYMOUS HEMIANOPSIA.
DIAGNOSIS, EMBOLISM OF LEFT POSTERIOR CEREBRAL
ARTERY AND SOFTENING OF THE LEFT CUNEUS. EMBOLISM
OF RIGHT MIDDLE CEREBRAL ARTERY TWO YEARS LATER;
DEATH.

This case came under my observation twenty-seven years ago; it was one of the most important cases which up to that time had been recorded, in support of the view that the half-vision centre in man is located in the cuneus and back part of the occipital lobe. The nature of the lesion was diagnosed, and its exact position predicted two years before death. The lesion was very definitely localised and unassociated with any other cerebral lesion likely to have produced the visual defect which was present; it is therefore free from the objections which had been brought against some of the other cases which had been recorded up to that time.

The fields of vision were very carefully charted by myself on 27th September 1888 (see Fig. 6) and on 22nd July 1890; during the two years that the patient lived they remained practically unchanged. It will be noted that the dividing line of the hemianopsia does not pass through, but curves round, the fixing point.

The case shows that, in man, destruction of the half-vision centre produces permanent hemianopsia.*

The notes of the case are as follows:—

Mrs. B., aged 47, was seen, in consultation with the late Dr. George Mackay of Bruntfield, Edinburgh, on 23rd September 1888, on account of mitral stenosis, from which she had suffered for more than eight years.

On 24th July 1888, two months before I saw her, she was suddenly seized with giddiness, partial loss of consciousness, and slight loss of power in the *left* arm and leg.

In the course of a few days the loss of power in the arm and leg disappeared, but she did not get well. For a fortnight she remained in a stupid dazed condition, and without apparently clearly realising

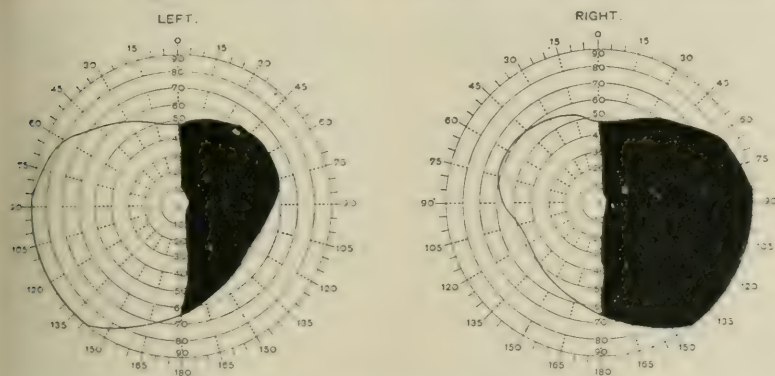


FIG. 6.—Perimeter Chart in the Case of Embolism of the Left Posterior Cerebral Artery and Softening of the Left Cuneus described in the Text, showing Right-sided Homonymous Hemianopsia.

her condition. She would smile and answer when spoken to, but for the most part lay quiet, taking little notice of her surroundings. She did not seem to realise that she had been ill, and more than once asked why she was being kept in bed.

At the end of a fortnight she gradually became brighter, was able to sit up and get out of bed. The paralysis of the arm and leg had then completely disappeared.

Condition on Examination.—The patient, a thin dark sallow woman, looked ill. The heart's action was very quick (120 per minute), irregular and weak; a very distinct presystolic murmur was audible at the apex. There was no evidence of the left hemiplegia which had temporarily followed the onset of the attack, no loss of motor power, no anaesthesia, no difference in the reflexes on the two sides.

* The case was recorded in my *Atlas of Clinical Medicine*, vol. ii. p. 40 (published in the year 1893).

The patient's daughter stated that her mother's memory was impaired; but I did not ascertain if this loss of memory was chiefly related to visual impressions.

The patient stated that at times she felt stupid—as if she had got a blow on the head; that she sometimes felt giddy. There was no headache and no vomiting.

The pupils were of medium size and equal; they contracted actively to light. The optic discs were normal.

The fields of vision both for white and for colours were, a few days later, very carefully mapped out by means of the perimeter.

There was no aphasia, either sensory or motor; the patient's power of reading and writing was, of course, carefully tested.

Diagnosis.—The sudden attack of unconsciousness, followed by slight left hemiplegia and the other symptoms described above, were obviously the result of an embolism.

The further question as to the position of the lesion and the vessel which had been plugged was more difficult.

The *right-sided* homonymous hemianopsia, without, at the time of my visit (two months after the embolic attack), any other symptoms indicative of a localised cerebral lesion, indicated an embolism of the left posterior cerebral artery and softening of the left half-vision centre in the cuneus and back part of the left occipital lobe.

The *left-sided* hemiplegia which temporarily followed the onset of the attack did not, however, tally with this diagnosis, for hemiplegic symptoms due to a lesion in the left hemisphere would have been right-sided. There seemed to be only two ways out of the difficulty—to suppose (1) that the patient's friends and Dr. Mackay were mistaken with regard to the side which was paralysed, *i.e.* had forgotten which side was affected; this seemed unlikely, though I know from personal experience how easily such mistakes may arise: or (2) that there had been two separate emboli—one of the left posterior cerebral artery, the cause of the right-sided homonymous hemianopsia; the other of the right middle cerebral artery or one of its smaller branches, the cause of the left hemiplegia.

The autopsy showed that the second view was correct, for an old softening, which did not involve the internal capsule, was present on the right lenticular nucleus; it was just the kind of lesion which would have produced the symptoms—a slight temporary hemiplegia on the opposite (left) side.

Subsequent Progress of the Case.—The patient slowly but gradually improved, and, with some ups and downs, kept wonderfully well until 6th December 1890, two years and three months after I first saw her. During this time I personally examined her on more than one occasion.

On 22nd July 1890 the hemianopsia was practically unchanged, the only difference being that a slight peripheral constriction of the upper

half of the seeing (unaffected) portions of the fields was now present. The hemianopsia for colours was still present.

The patient stated that she still at times "felt dazed—as if she had had a blow on the head." Her daughter further stated that the patient did "not notice things quickly, and that she was so slow in this respect that her family often laughed at her." This seemed to point

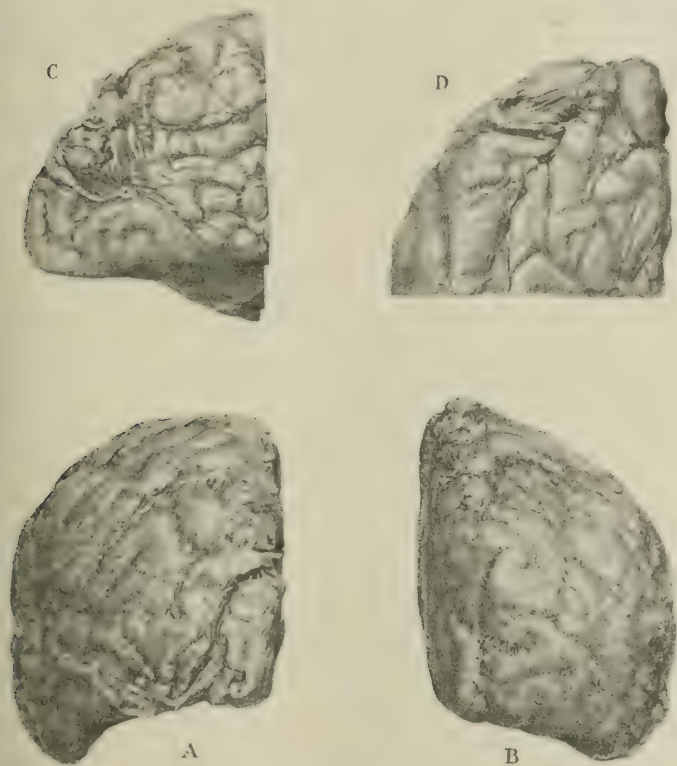


FIG. 7.—The Occipital Lobes of the Brain in the Case of Embolism of the Left Posterior Cerebral Artery and Softening of the Left Cuneus described in the Text, showing the Lesion in the Tip of the Left Occipital Lobe.
Left (A) and right (B) occipital lobes, seen from behind.
Inner surface (C) and under surface (D) of left occipital lobe.

to a condition of partial "mind-blindness"; there was, however, no "word-blindness."

6th December 1890.—I did not see the patient again until this date. She went to bed very well the previous evening, at 4 A.M. rose and spoke to her daughter who slept with her, at 7 A.M. was found to be unconscious, and remained so for several hours.

At the time of my visit the pulse was 150; the respirations 44; the temperature in the left axilla 98.6°; the body bathed in sweat;

swallowing difficult. She opened her eyes when told to do so, but did not protrude the tongue. There was well-marked conjugate deviation of the head and eyes to the left; the right face, arm, and leg were paralysed; the conjunctival reflex on both sides was absent.

The patient died a few hours after my visit.

The *post-mortem examination* was made on 8th December.

The mitral stenosis was very marked; the left auricle was considerably dilated, and its appendix stuffed with firm old clot, from the surface of which a softer clot, which was no doubt the source of the recent embolon, projected.

The intracranial portion of the left internal carotid artery and the left middle cerebral artery, at its point of origin, were plugged with a large recent embolon.

The posterior part of the left occipital lobe was wasted—the result of an old softening.

The brain, after hardening *en masse*, was photographed from behind (see Fig. 7, *A* and *B*), then cut up into a series of transverse vertical sections, which were individually photographed; sketches of the inner (*C*) and under (*D*) surfaces of the occipital lobe were also made for me by Mr. John Williamson (see Fig. 8).

These drawings and some of the photographs showing the position of the lesions and the course of the secondary descending degeneration which was present in the optic radiations are represented in Fig. 8.

The lesions found as the result of the more detailed examination of the brain were—

1. An old softening of the inferior half of the cuneus, the inferior occipital convolution, and the immediately adjoining white substance of the occipital lobe on the left side (see Fig. 8, *A*).

The softening of the white substance was strictly confined to the posterior end of the occipital lobe; it did not extend farther forwards than the posterior extremity of the lateral ventricle; it did not involve the anterior end of the occipital lobe, the angular gyrus, or the adjacent convolutions of the temporal or temporo-sphenoidal lobes.

2. A narrow band of secondary descending degeneration, which occupied the position of the optic radiations of Gratiolet (*a*), and which could be traced down to the pulvinar of the optic thalamus, to which the letter *b* in Fig. 8 points.

3. A small area of old softening, the size of a threepenny piece, on the superficial aspect of the first left temporal convolution, to which the letter *c* in Fig. 8 points.

4. An area of old softening, about the size of a sixpence, strictly limited to the *right* lenticular nucleus, to which the letter *d* in Fig. 8 points. This was doubtless the cause of the slight temporary left-sided

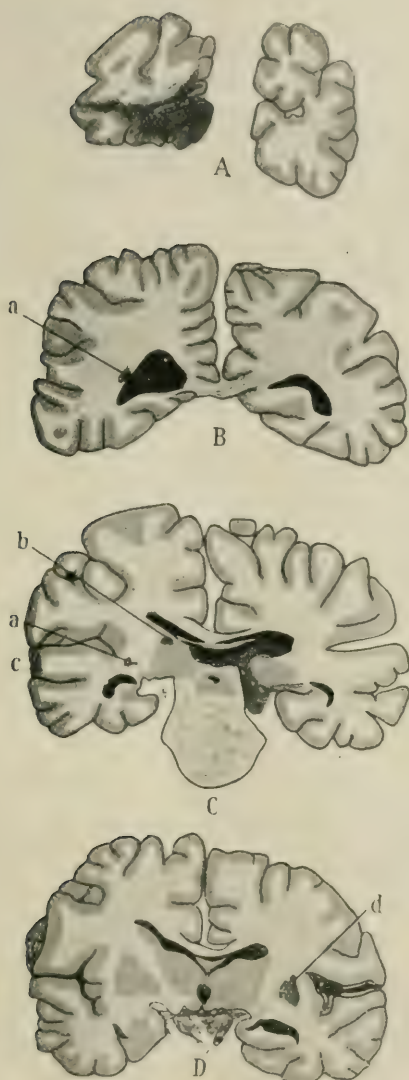


FIG. 8.—Transverse Vertical Sections through the Brain in the Case of Embolism of the Left Posterior Cerebral Artery and Softening of the Left Cuneus described in the Text (seen from behind).

A, Through the occipital lobes, showing softening of the lower part of the cuneus and interior occipital convolution on the left side.

B, At the level of the posterior end of the corpus callosum, showing secondary degeneration of the fibres of Gratiolet (a) on the left side.

C, At the level of the pulvinar, showing secondary descending degeneration of the fibres of Gratiolet (a), of the pulvinar (b), and of the upper temporo-sphenoidal convolution (c) on the left side.

D, At the level of the lenticular nucleus, showing softening of the lenticular nucleus (d) on the right side.

hemiplegia, which was a puzzling feature of the original embolic attack.

Remarks.—The case shows the great localising value which homonymous hemianopsia has in some cases of brain disease. In this case the hemianopsia was the only definite and distinct indication which permanently remained of a grave cerebral lesion; for the very partial “mind-blindness,” which appeared to be present, would not, in the absence of hemianopsia, have attracted much attention, and would perhaps have been missed.

From the scientific point of view the case is one of great importance. In my remarks on the case, when published in the year 1893, I stated: It conclusively shows (1) that, in man, the half-vision centre is situated in the back part of the occipital lobe—the cuneus and, perhaps, immediately adjacent parts; and (2) that, in man, destruction of this portion of the brain, the angular gyrus and adjacent convolutions being unaffected, produces permanent homonymous hemianopsia on the opposite side.

SENSORY (VISUAL) “JACKSONIAN” EPILEPSY—FLASHES OF LIGHT TO THE RIGHT FOLLOWED BY RIGHT-SIDED HOMONYMOUS HEMIANOPSIA—DUE TO A DISCHARGING LESION ON THE OUTER SURFACE OF THE TIP OF THE RIGHT OCCIPITAL LOBE.*

In this case an old syphilitic lesion (cicatrix), adherent to the membrane on the one hand, and to the outer surface of the tip of the right occipital lobe of the brain on the other, led to the production of a series of recurring flashes of light (which were referred to the right eye) and right-sided homonymous hemianopsia.

The case is an example of a rare condition—*sensory* (visual) “Jacksonian” epilepsy. It demonstrates that an irritative lesion on the outer surface of the posterior part of the occipital lobe may produce frequently recurring flashes of light in the corresponding halves of the retina with which the half-vision centre is connected.

It also proves that the irritative symptoms (the flashes of light), which result from the discharge of the half-vision centre, are followed by, and may while they are occurring be associated with, a condition of temporary (exhaustion) paralysis of the ele-

* The case is more fully reported in my *Atlas of Clinical Medicine*, vol. ii. p. 42.

ments which are discharged during the attack. This temporary sensory paralysis, which is manifested externally in the form of homonymous hemianopsia on the side opposite to the lesion, exactly corresponds to the temporary (exhaustion) motor paralysis which occurs in connection with ordinary motor Jacksonian attacks (localised epileptiform spasms) due to a discharging lesion of the motor area.

Like motor Jacksonian attacks, these sensory Jacksonian attacks may be of great diagnostic value from a localising point of view. The next case illustrates this point in a striking way. It is important, however, to note that in the present case the lesion was not directly over the half-vision area (calcarine region), but on the *outer* surface of the tip of the occipital lobe. The same thing is not infrequent in cases of ordinary motor Jacksonian epilepsy—a lesion outside the motor area producing Jacksonian attacks—and is apt to lead to mistakes in exact localisation.

Further, the case shows that a localised irritative lesion on the outer and inferior aspect of the occipital lobe may lead to loss of half-vision of all kinds—for colours as well as for white.

The notes of the case are as follows:—

C. W., aged 63, usher in a school, formerly a soldier, was seen on 5th March 1887 complaining of frequent flashes of red and white light in the right eye.

Precious History.—The patient contracted a chancre, not followed by secondary symptoms, at the age of 24. The same year (1848) he was, during the Chartists' riots at Northampton, thrown headforemost through a shop window, the head and face being very severely cut; there were, he says, as many as forty or fifty wounds. The face and scalp, which is bald, are still thickly covered with fine linear cicatrices, some of which are fully an inch in length. The bleeding which resulted from these injuries was excessive and nearly proved fatal—the patient is the subject of the "hæmorrhagic diathesis."

He enjoyed good health until 1863; he then suffered from severe headache, chiefly felt over the back and top of the left side of the head and much worse at night. At this time a swelling, tender to touch, fully the size of half an egg, developed on the head, at a point about 1 inch behind and slightly above the left parietal eminence, and an extensive serpiginous ulcer (the cicatrix of which still remains) over the middle of the left calf.

During this illness he had a severe epileptic fit, with loss of consciousness. He has since had three other epileptic fits of a similar nature. The exact date of the second he does not remember. The third occurred in the year 1883, and the fourth in the year 1884. He

does not think that the first and second fits were preceded by flashes of light in the right eye, but the third and fourth were.

For the past ten years he has suffered every now and again from "attacks of flashings" in the right eye. These attacks consist of a series of paroxysms. Each paroxysm lasts for a brief period (half a minute to two or three minutes). During the paroxysm he sees red and white flashes of light, exactly, he says, like a magic lantern. He states that the flashes are seen with the right eye. (The flashes are evidently seen on the right side of the middle line, and referred by the patient, as is usually the case in discharges of this description, to

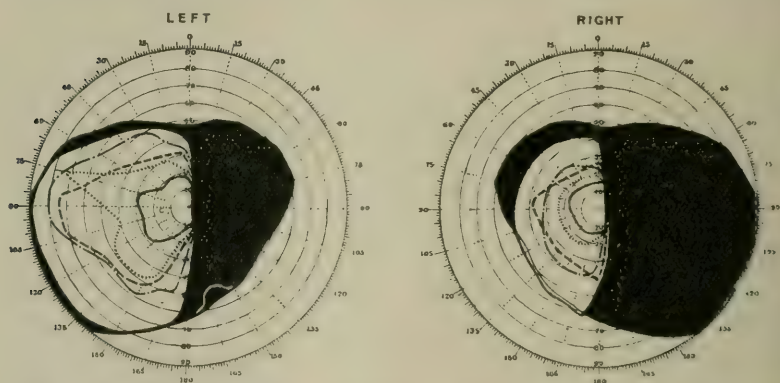


FIG. 2.—Chart of the Fields of Vision for White and for Colours, taken on 5th March 1887, in the Case of Sensory (Visual) "Jacksonian" Epilepsy described in the Text, showing Right-sided Homonymous Hemianopsia.

The whole of the right half of the field is lost in each eye, but the hemianopsia does not come quite up to the "fixing" point and the middle line. The black portions represent the parts in which vision is lost. In the left eye there is some peripheral constriction of the left half of the field for white, and considerable constriction of the fields for green, yellow, and blue; the red field is less affected. In the right eye there is some peripheral constriction of the upper surface of the left half of the field.

In the left eye, reading from left to right, at the level of the figure 90, the fields of vision are:—Black; blue (dash and dot); red (dash); yellow (dotted); and green.

In the right eye:—Black; red (dash); blue (dash and dot); yellow (dot); and green.

the eye on the side to which they are projected. The nervous elements discharged evidently correspond to the left half of each retina.) The paroxysms occur with great frequency—every five or ten minutes—and the whole attack (consisting of innumerable separate paroxysms or discharges) usually lasts for three or four weeks.

At first these attacks occurred about once a year; latterly they have been more frequent, and have occurred every six or seven months. He knows no exciting cause for the attacks.

After the attacks have lasted for some time (usually some days) he is unable to see objects on his right side (right-sided hemianopsia). He states that he has frequently knocked up against people, lamp-posts, etc., in the street in consequence of this blindness. After the attacks of flashing ceased the loss of vision also disappeared.

He has suffered more or less, but at irregular intervals, during the past ten years from headache. The pain is felt over the whole head, more especially on the left side, and is chiefly referred to a point on the back of the head, which is situated behind and above the left parietal eminence. There is no localised tenderness on skull percussion. There has been no vomiting. The optic discs are normal.

During these sensory (visual) Jacksonian attacks he suffers more or less constantly from a noise, like a steam-engine, in the right ear; it is much worse during the individual paroxysms of flashings (*i.e.* attacks of sensory "Jacksonian" epilepsy).

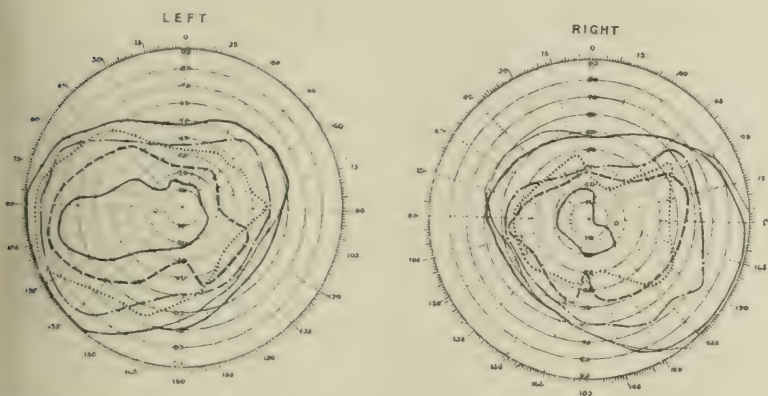


FIG. 10.—(Chart of the Fields of Vision for White and for Colours, taken on 6th June 1887, in the Case of Sensory (Visual) "Jacksonian" Epilepsy described in the Text; the Hemianopsia for white has now completely disappeared. The right field is still slightly constricted. In the left eye the green field is still somewhat, and the red field still slightly, constricted to the right. In the right eye the green field is still much, and the yellow field still to some extent, constricted towards the right. In the left eye, reading from left to right, at the level of the figure 90, the fields of vision are:—Black; yellow (dotted); blue (dash and dot); red (dash); and green. In the right eye:—Black; blue (dash and dot); red (dash); yellow (dotted); and green.

In 1886 an ulcer formed on the under surface of the left side of the tongue; it was diagnosed as epithelioma, and removed by operation. Severe secondary hæmorrhage, which nearly proved fatal, followed the operation. His speech is much impaired since the operation, and an ulcer has since formed on the inner surface of the gum on the left side.

Present Condition.—The patient, a very intelligent man, was pale, but fairly well nourished. Several paroxysms of flashings were observed. During the attack the eyeballs were turned slightly to the right, the palpebral fissures slightly narrowed, and slight tremors occurred in the orbicularis palpebrarum; the eyes had a somewhat vacant look, as if the patient was somewhat dazed or was looking without fixation into space.

The colour of the face, the character of the pulse, and the size of the pupils were not perceptibly altered during the attacks.

Right-sided homonymous hemianopsia was present; the fields of vision, both for white and for colours, were mapped out with the greatest care by means of the perimeter (see Fig. 9). The field for yellow was proportionately more contracted than the fields for blue and red. There was, it will be noted, some peripheral constriction of the sound half-fields for white.

The fundi oculi were normal. There was no "word-blindness." Smell, which for some years had been less acute in the *left* than in the right nostril, was not altered during the present attack.

The heart, kidneys, and organs generally seemed healthy.

Subsequent Progress of the Case—Under iodide and bromide of potassium the paroxysms of flashings soon subsided, and the hemianopsia for white disappeared. The charts representing the fields on 6th and 8th June (*i.e.* after recovery from the hemianopsia) are represented in Fig. 10.

6th June.—In the *right* eye there still remained some slight peripheral contraction of the field for white, more especially at the upper surface of the nasal half, while the area for white extended beyond the normal (as it did at the time of the hemianopsia) at the lower edge of the same (nasal) half of the field for that eye. The green field was still markedly, and the yellow and blue fields to some extent, contracted on the side of the former hemianopsia.

In the *left* eye the field for white was equal to the normal all round: it extended beyond the normal at the lower surface of the right half (the side of the former hemianopsia). The field for green in this eye was somewhat contracted towards the right.

On 15th June the visual acuteness was, after correction of refraction, normal. The pupils, which were now small, contracted actively both to light and on convergence. The headache of which the patient formerly complained had disappeared.

The patient died a few months after he first came under my notice from epithelioma of the mouth and throat.

Post-mortem Appearances.—The membranes of the brain were adherent over the outer surface of the posterior part of the left occipital lobe and over the adjacent surface of the cerebellum (see *a* and *c* in Fig. 11).

The brain substance, for the depth of about a quarter of an inch underneath the position of the adherent membranes, was sclerosed and atrophied, and had evidently at one time been the seat of inflammatory (apparently syphilitic) changes. The other parts of the brain were absolutely healthy.

MELANOTIC SARCOMA OF BRAIN, ETC.; LARGE SARCOMATOUS MASS INVOLVING THE LEFT CUNEUS AND UPPER OCCIPITAL CONVOLUTION; SENSORY (VISUAL) "JACKSONIAN" ATTACKS—FLASHES OF BRIGHT LIGHT, WORSE IN THE RIGHT EYE.*

S. E. M., female, aged 31, seen with Dr. Allan Jamieson on 27th September 1886, and died on 2nd November 1886.

History.—In 1882 (four years before I saw the case) a fungating black nodule (round-celled melanotic sarcoma), the size of a walnut, was removed from the right shoulder.

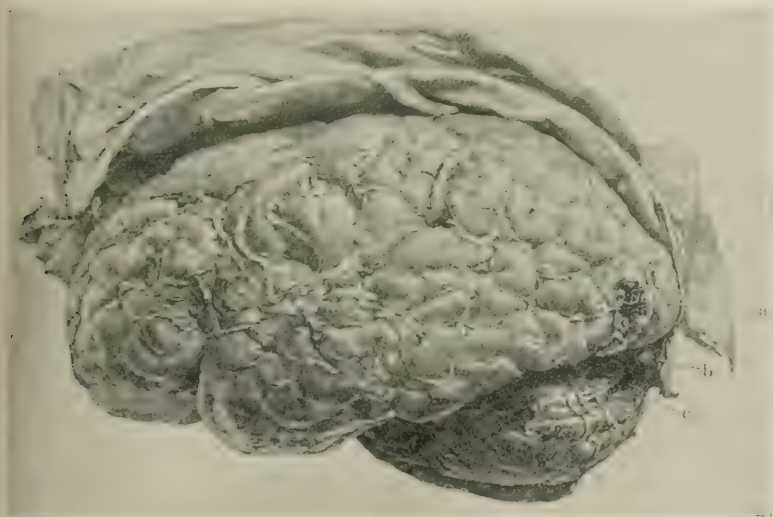


FIG. 11.—The Outer Surface of the Left Hemisphere of the Brain, with the Dura Mater Attached, in the Case of Sensory (Visual) "Jacksonian" Epilepsy described in the Text.

A thickened triangular portion of the membrane (to which the letter *b* points) was adherent to the adjacent portions of the occipital lobe and of the cerebellum. The letter *a* points to the part of the occipital lobe (outer surface of the inferior convolution), and *c* to the part of the cerebellum to which the cicatrix was attached.

The patient remained well until *July* 1886. She then began to suffer from headache and vomiting and to see bright flashes of light before her eyes; they were worse in the right eye (*i.e.* to the right of the middle line); they varied in size from a small button to a large globe, and resembled in colour and brilliancy the electric light. The flashes were always accompanied or followed by headache. The paroxysms of headache and flashes of light occurred very frequently. Between the attacks of headache her sight was good; during the paroxysms she was, she said, completely blind.

Condition on 27th September 1886.—Frequently recurring attacks of

* The case is more fully reported in my *Atlas of Clinical Medicine*, vol. ii. p. 47.

intense headache and urgent vomiting. During the paroxysms of headache the face is flushed, the pulse quick and irregular, and the patient sees bright flashes of light in the eyes, more marked on the right side. The headache and flushing were always observed in combination; she never had a paroxysm of headache without flushing, and never flushing without having headache. There was no giddiness.

Well-marked double optic neuritis was present; there was no hemianopsia.

The mental condition was quite clear; there were no symptoms suggestive of hysteria.

At this stage there was no paralysis, but the patient had some difficulty in directing the movements of the left arm. The knee-jerks were absent; the plantar reflex was active on both sides.

Hearing, taste, and smell were normal. The urine was free from albumen, and was never noticed to be dark or smoky.

Progress of the Case.—The attacks of severe headache, vomiting, flushings, and flashes of light in the eyes continued; the left arm and leg became paralysed. The patient died on 2nd November 1886.

Post-mortem Examination.—The post-mortem examination was made on 4th November. The cicatrix on the shoulder was normal and free from any melanotic deposits. Melanotic deposits were present in the right tonsil, a gland on the left side of the neck, the omentum, kidneys, and brain. There were no melanotic deposits in the liver.

Head.—The scalp, skull-cap, and outer surface of the dura mater were normal. The dura, which was considerably thickened and infiltrated with sarcomatous elements, was adherent just above the tip of the left occipital lobe, where a melanotic growth the size of a walnut was situated; it involved the surface of the brain.

The pia mater and arachnoid were normal. The convolutions of the brain were markedly flattened and the sulci effaced; the surface of the brain was very anæmic.

Several small melanotic deposits were seen on the surface, and numerous deposits in the substance of the brain. The prefrontal and occipital lobes were the parts which were chiefly invaded. The motor areas and great basal ganglia were much less extensively involved; a few minute, almost microscopical, deposits were present in both lenticular nuclei; a nodule of larger size involved corresponding and adjacent portions of each optic thalamus; and a small nodule was situated in each island of Reil.

A nodule of considerable size, which was very sharply defined and limited to the position of the pyramidal tract in the right half of the pons Varolii, was evidently the cause of the paralysis, which was at first limited to the left arm, but which ultimately involved the left leg.

The middle lobe of the cerebellum was almost entirely destroyed

by a large melanotic mass, and there were several other smaller deposits in its lateral lobes.

A large nodule involved the surface of the left cuneus and the posterior end of the upper occipital convolution on the left side of the brain (see Fig. 12).

The new growth was a typical round-celled melanotic sarcoma.

Remarks.—The chief point of interest in this case, so far as



FIG. 12.—Occipital Lobes of the Brain and Cerebellum in the Case of Melanotic Sarcoma described in the Text, showing a Large Melanotic Deposit on the Posterior End of the Left Occipital Lobe; it involves the Cuneus and Upper Occipital Convolution.

the present communication is concerned, is the association of the electric-like flashes of light, more marked in the right than in the left eye (*i.e.* on the right of the middle line), with a large sarcomatous deposit on the surface of the *cuneus* and posterior end of the upper occipital convolution on the left side of the brain. These flashes of light were evidently epileptiform in character—sensory (visual) “Jacksonian” attacks—and depended upon the (discharging) lesion of the centre for half-vision in the cuneus and back part of the left occipital lobe.

A CASE OF RAT-BITE FEVER.

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and

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CASES of rat-bite fever or "sokodu," which is endemic in Japan, have been recognised not infrequently in Europe and in the United States during recent years. The literature contains accounts of some fifteen or sixteen cases in the British Isles, and it is not improbable that the condition may be more common in this country than would appear from the number of recorded cases. So far as we have been able to ascertain, only one case has hitherto been reported in Scotland.¹

A full description of the disease, with reports on the British cases up to 1912, is given by Atkinson.² Cases have also been described by Horder,³ Hewlett and Rodman,⁴ Cruikshank,⁵ Dick and Rutherford,⁶ and others.

The condition, as its name indicates, results from the bite of a rat, although it has been known to follow bites from other animals (kitten, ferret). It is characterised by a definite incubation period, during which no symptoms are, as a rule, referable to the site of injury, and the duration of which appears to vary from about a fortnight to several months. This is followed by a well-marked invasion, associated with pain and swelling around the healed bite, enlargement of lymphatic glands, fever, headache, nausea, and mental dulness. These symptoms may persist for several days, are followed by a remission, and again, after a period of days, by a recurrence of the fever. These periodic attacks may continue for several months, but may extend over a much longer period. Frugoni⁷ records a case lasting for two and a half years, and Hara (quoted by Atkinson) one of seventeen years' duration.

The degree of local reaction varies in intensity. It does not proceed to suppuration, but ulceration, vesiculation, and gangrene may occur. In the case recorded by Cruikshank amputation of the finger became necessary for the last-named reason.

Although periodic attacks of fever are typical of the condition, the temperature, in some cases, may remain elevated for the first few weeks of the disease, the intermittent character appearing later. Rashes of various types are frequent, and arthralgias, affecting, as a rule, the larger joints, are described. There is a leucocytosis during the febrile period, and Frugoni describes a well-marked eosinophilia at

a late stage of the disease. Spontaneous recovery is the rule, but in Japan the case mortality is said to be about 10 per cent.

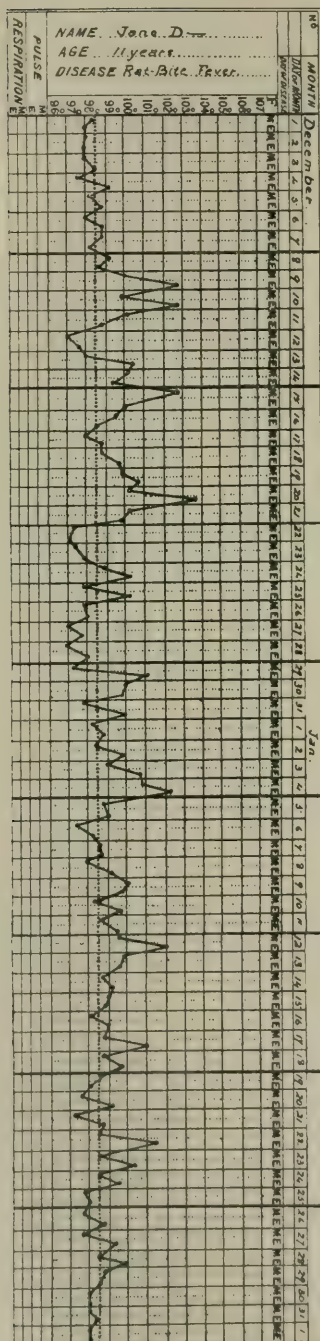
Atkinson bases the diagnosis on—(1) History of a bite by a rat or some animal which has been in contact with rats; (2) the incubation period; (3) the absence of pus or pus organisms on incision of the swelling; (4) the periodic fever uncontrolled by quinine; (5) the presence of erythematous and urticarial rashes; and (6) the absence of suppuration in the lymphatic glands.

The causation is not yet fully elucidated. A protozoön—*Sporozoon muris Japonicum*—has been described by Ogata,⁸ and a variety of coccid and bacillary forms have been found by other investigators. It may, however, be questioned whether rat-bite fever is always one and the same thing, or whether a variety of pathological conditions may not be included under this name. This view is upheld by Proescher,⁹ who bases his opinion on the results of animal inoculation with material obtained from clinical cases. Lagriffe and Loup,¹⁰ who describe an atypical case, characterised by a very short incubation period (three days) and a continuous, slightly elevated temperature, suggest that the clinical phenomena may be due to (1) the sporozoön of Ogata; (2) absorption of toxins or ptomaines; or (3) anaphylaxis. The evidence in favour of the two last-named solutions appears rather indefinite.

The details of the case observed by us are as follows:—

J. D., female, aged 11, was admitted to Lochmaben Combination Hospital on 25th November 1914, suffering from diphtheria, on the tenth day of the disease. On admission her temperature was 99·4° F.; pulse, 90. Both nostrils were blocked, and there was a slight muco-purulent nasal discharge. The fauces were congested, but free from membrane. There was a trace of albumin in the urine, and the patient's general appearance did not suggest that the case was likely to be a severe one. Swabs from the nostrils showed the presence of Klebs-Löffler bacilli. Antitoxin was administered and local treatment carried out in the usual way. In the course of the next week the nasal discharge dried up, nasal breathing was re-established, the temperature remained practically normal, and there was every appearance of complete convalescence until 9th December, the twenty-fourth day of her diphtheritic attack, when the temperature suddenly rose to 102·8° F. (see Chart).

Nothing could be discovered to account for this elevation of temperature, save what appeared to be the beginning of a small furunculus on the upper and back aspect of the right pinna. On the following morning, 10th December, there was a remission, the temperature falling to 99·8° F., but the furunculus was enlarged and the area of redness increasing. By evening the temperature had risen again to 102·8° F., and the pulse was 120. The tissues behind the pinna were swollen till there was practically no sulcus between the pinna and the head, the tumour being hard, red, and tender, without any fluctuation or evidence of pus formation. The patient appeared sharply ill, was apathetic—almost in a state of stupor—did not understand or reply to questions. The pupils were dilated, scarcely responding to light; the countenance was dusky;



the breathing shallow; the pulse weak; and the extremities rather livid and cold. In fact her appearance at this time and during two subsequent attacks suggested an impending dissolution. On the following morning (11th December) her temperature had remitted to 100·2° F., her pulse was 118, and improvement continued rapidly till the morning of 12th December, when the temperature was 97° F. and the pulse 76. At the same time there was a marked change in the patient's appearance; her circulation, sight, and mental activity became normal, and it was difficult to realise that she had just passed through such a crisis. She ate and slept well, and the swelling around the pinna disappeared as rapidly as it had arisen, leaving, however, a chain of enlarged glands down the margin of the sterno-mastoid and along the clavicle. The patient did not appear to have any recollection of what she had come through, but was quite as bright and vivacious as she had been before the attack.

Swabs taken from the nostrils on 9th and 12th December were reported negative.

She continued well till the evening of 13th December, when her temperature rose to 100·4° F., falling next evening to 99·4° F. On the morning of 15th December there was a sharp rise to 102·8° F.; pulse, 115; and a remission on the same evening to 100° F.; pulse, 98. The patient passed through the same phases as already described in the first attack, save that the swelling behind the pinna did not recur.

There was again an intermission of four days, till on the evening of 19th December the temperature rose to 100·6° F., and reached 103·6° F. the succeeding evening, the pulse-rate being 132. This attack, clinically, was identical with the two former, save that the stools, which had previously appeared healthy, became extremely offensive.

That the condition was an infective one appeared obvious, but the diagnosis remained obscure. Blood-films offered no suggestion, polyvalent anti-streptococcus serum had been given without appreciable effect, when inquiries made

at the patient's home regarding her antecedents elicited the interesting fact that on the third night before her admission to hospital 22nd November she had awakened the household by screaming that she had been bitten by a rat, and that on examination the ear was, in fact, found to be bleeding.

On receiving this information we at once recognised that we were dealing with a case of "sokodu." The ear was carefully examined, but we were unable to find the slightest trace of a bite.

The intermittent fever continued severe, the paroxysms lasting as a rule about 30 hours, with intervals of three to four days, with clinical appearances as described, until 24th January 1915, when *tache cérébrale*, which had been well marked towards the end of December, was now noted as "present, but not so marked." From this time, while the periods of intermission continued much the same, the temperature, on each succeeding paroxysm, reached a lower level, until the 28th of January, when it rose only to 99.8° F., after which date the paroxysms entirely disappeared. The child made a rapid convalescence, and was discharged on 6th February, after being 73 days in hospital. A note was sent to her doctor informing him of the circumstances and asking him to keep her under observation. He replied that her dwelling was in a dilapidated condition and infested with rats, and later, that at the date of writing there had been no reappearance of fever and the patient remained well.

We have described the case in some detail, as, while agreeing in many points with those hitherto reported, it presents certain features of interest. First, the definite history and date of the rat-bite, and the fact that the disease developed while the patient was already under observation in hospital, enabled the incubation period—17 days—to be fixed exactly. Second, the duration of the disease—from 9th December to 28th January—51 days—followed apparently by complete recovery. Third, the apparent predilection of the toxin for the nerve centres, producing an apathetic, almost comatose, condition during the attacks, and the abrupt transition to normal in the intervals. This suggested also the necessity for extreme caution in prognosis when dealing with such a case. Our patient on several occasions seemed to be approaching death, and had a prognosis then been given, it would have had to be very materially recast, probably within a few hours, when the case entered the succeeding stage, and this to the discomfiture and discredit of the attendant.

It is noteworthy also that the patient passed through the incubation period of rat-bite fever while suffering from an attack of nasal diphtheria. The possibility that the diphtheria toxin may have produced a *locus minoris resistentie* in the central nervous system, thus determining to some extent the clinical phenomena of the sequent infection, at once suggests itself, but whether this hypothesis be correct we are unable to say. The nasal swabs were negative, as regards the Klebs-Löffler bacillus, before the first paroxysm.

Blood-films were taken before, during, and after the febrile attacks, but revealed nothing of importance. No parasites of any kind could

be detected in films stained by Leishman's or Giemsa's methods, and on no occasion was there an eosinophilia.

The local manifestations—swelling round the seat of injury, enlarged lymphatic glands, absence of suppuration—correspond with those of formerly described cases. The joints were unaffected, and though careful watch was kept, no rash of any kind was detected at any stage of the disease.

REFERENCES.—¹ Middleton, *Lancet*, 11th June 1910. ² Atkinson, *Med. Chron.*, Fourth Series, 1913, vol. xxv. ³ Horder, *Quart. Journ. Med.*, 1910 (iii.), No. 10. ⁴ Hewlett and Rodman, *Practitioner*, 1913. ⁵ Cruikshank, *Brit. Med. Journ.*, 1912 (ii.). ⁶ Dick and Rutherford, *ibid.*, 1913 (ii.). ⁷ Frugoni, *Berl. klin. Wochenschr.*, 1912 (abstract in *Off. Int. d'Hygiène Publique*, tome iv.). ⁸ Ogata, *Deutsche med. Wochenschr.*, vol. xxxiv. ⁹ Proescher, *Internat. Clinics*, 1911, vol. iv. ¹⁰ Lagriffe et Loup, *Presse Médicale*, 1914, No. 31.

ON WASTING OF THE HAND. WITH SIX
ILLUSTRATIVE CASES.*

By A. FERGUS HEWAT, M.B., F.R.C.P.

I wish to show you this morning six cases presenting one feature in common, viz. wasting of the hand.

These cases illustrate very well the diversity of pathological lesion which may bring about a somewhat similar appearance of the hand or hands, at least on a superficial examination.

They also illustrate points in the differential diagnosis which are of the utmost importance in prognosis and treatment.

CASE I.—The first case is that of a man, aged 30—a paper-maker. He prepares the pulp prior to its being compressed between two heavy rollers. Some months ago, during this work, his right hand was caught and pulled in between the rollers. This, in addition to his efforts to extricate the hand, caused severe crushing to the hand and a general wrenching force to the whole arm. On making a physical examination we find a wasted hand, the fingers of which he is unable to straighten fully; the power of adduction and abduction of the fingers is almost totally lost, from the wasting of the interossei muscles. The hypothenar and thenar eminences are both wasted, and the power of his thumb is much impaired. The grasp of the hand is weaker than normal. As a result of this muscular wasting the hand tends to assume a claw-like attitude. The fingers cannot be fully extended, due chiefly to wasting of the lumbricales. The normal contour of the forearm below the internal condyle is lost, due largely to wasting of the flexor carpi ulnaris.

On testing his sensibility to painful stimuli there is distinct impairment over the ulnar side of the hand, wrist, and forearm, and to a limited extent along the inner side of the upper arm. He is unable to appreciate light touch in the same area, but the distribution is not quite so extensive as that for loss of painful stimuli. He has a small burn on the ulnar side of his wrist. He was unaware of it till he saw it.

On looking at the patient's eyes the following points in connection with the right eye are fairly obvious:—(1) The eyeball is somewhat retracted. (2) The palpebral fissure is slightly narrowed. (3) On shading the pupil no dilatation takes place.

These are the clinical facts of the case. What is the lesion producing these phenomena?

* A clinical lecture delivered in the Royal Infirmary of Edinburgh.

The case is one of Klumpke's paralysis, which is frequently due, as in this case, to a tearing of the 8th cervical and 1st dorsal motor and sensory roots as they leave the cord. If we call to mind for a moment the motor and sensory root distribution of these segments the diagnosis is made easy.

Motor Involvement.—The 8th cervical and 1st dorsal roots supply all the small muscles of the hand and most of the flexor muscles of the forearm. The wasting in the hand is more marked than the wasting in the forearm, probably on account of the greater damage done to the 1st dorsal root.

Sensory Involvement.—The area insensitive to painful and tactile stimuli corresponds very closely to the sensory root distribution of the 8th cervical and 1st dorsal roots. The fact that the extent of loss to painful stimuli is greater than the area of loss to touch is characteristic of a root lesion.

Pupillary Changes.—These have a very important diagnostic significance, because by their presence they demonstrate that we are dealing with a lesion of the root before it has parted with its *rami communicantes* to the sympathetic system. This point assists in distinguishing the condition from a lesion of the brachial plexus, where no fibres of the sympathetic exist.

CASE II.—We now take up the examination of the second case—a man, twenty-four years of age, who first came under my care suffering from some curious mental symptoms. At times he became very violent, and was quite unaware of the fact after the attack passed away. On one occasion he tried to hang himself with the chain of the sink, but remembers nothing about the episode. You will note certain stigmata of degeneration, viz. high arched palate, deficient lobulation of ears, rudimentary extra nipples; there is also slight mental enfeeblement.

The weakness of his hand began rather suddenly by the development of acute pain down the inner side of the upper arm and along the ulnar side of his forearm. Pain also shot into his ring and little fingers. These fingers and the ulnar side of his forearm became, in a few days, exquisitely tender—in fact he could not even tolerate stroking with cotton-wool on these parts. The causation of this attack of pain could not be accurately determined, except in so far that there was obviously an intense neuritis. It was impossible at that time to make a complete examination of the nerves and muscles of the hand, but later, when the acute pain had subsided, we were able to make out the following facts:—

The fingers are all flexed, but the ring and little fingers are much more so than the first and second. There is hyperextension at the two inner metacarpo-phalangeal joints. There is some wasting of the

hand, especially marked at the hypothenar eminence. The little finger is abducted. True abduction and adduction of the fingers is very feeble and totally lost in the ring and little fingers. Ulnar flexion at the wrist is feeble.

On looking at the sensory side of the picture we find that there is an area of epicritic loss corresponding to the whole of the little finger, the ulnar side of the ring finger, and the ulnar side of hand, both anteriorly and posteriorly. The protopathic loss of sensation is confined almost entirely to the little finger. The patient likewise complains of a dull sensation over these areas. Pain is still elicited by pressing firmly over the ulnar nerve.

We are here dealing with a case of ulnar neuritis, which was at one time exceedingly acute, but has now passed off, leaving weakness and wasting of the muscles supplied by this nerve. The motor and sensory paresis corresponds to a lesion of the ulnar nerve, which you will remember supplies all the small muscles of the hand except the abductor and opponens pollicis, half of the flexor brevis pollicis, and the 1st and 2nd lumbricales, all of which are supplied by the median nerve. The absence of hyper-extension at the metacarpal phalangeal joints of the index and middle fingers is due in part to the functioning lumbricales. In the forearm the ulnar nerve supplies the flexor carpi ulnaris and half of the flexor profundus digitorum, hence the feeble ulnar flexion at the wrist. Anyone who has fallen asleep with the ulnar nerve at the elbow joint resting on a hard surface may remember that the tingling sensation in the ring and little fingers on waking corresponds to the cutaneous distribution of the ulnar nerve, as we have mapped out here.

CASE III.—The next patient presents a bilateral wasting of the hands, the right being rather more marked than the left. The history is that for some months he has noticed increasing weakness of the hands, especially the right, and this weakness has been noticed more particularly in the evenings. He has also felt shooting neuralgia-like pains down the inner side of his arms.

On examination of his hands we find general wasting in both. The thenar and hypothenar eminences are distinctly atrophied. The movements of the fingers are impaired, but not abolished. There is slight weakness of the ulnar side of the forearm. There are, in this case, no abnormal eye phenomena. There are no sensory changes of diagnostic import, except perhaps a little diminution of acuteness to touch along the inner side of forearm.

We have here a case which is apt to be erroneously diagnosed.

The condition is probably one known as "cervical rib." This extra rib, or extra long transverse process, produces pressure on the inner cord of the brachial plexus, which is formed from the 8th cervical and 1st dorsal segments of the cord. The lesion therefore does not involve the rami communicantes, and so eye symptoms are absent.

X-ray examination may assist in the diagnosis, but as this aid is not always at hand, it is important to keep in mind the possibility of a cervical rib causing such symptoms. It must be borne in mind also that many people may have a certain degree of cervical rib but suffer from no symptoms of the condition. These symptoms of pain and wasting may develop after the patient has been confined to bed for a few weeks for some entirely different condition.

CASE IV.—The next patient, an old man, also shows a bilateral wasting of his hands, and the wasting seems to be much in excess of the loss of power of the muscles, for although his hands look almost like skeletons, yet he is able to use them to a certain extent. Note especially the typical appearance of the hands—they show the claw or monkey hand to a marked degree. The phalanges are flexed, forming a curve, with the thumb lying in close apposition to the index finger. At the metacarpo-phalangeal joints we see hyperextension, and on looking at the palms of the hands the heads of the metacarpal bones are well seen. The power of abduction and adduction of the fingers is almost entirely lost, and he cannot fully flex or extend his fingers. The hypothenar and thenar eminences are much wasted. If the wasting were not so marked we would see fine fibrillary tremors in the muscles of the hand. Note also that the ulnar side of both forearms is much wasted. Instead of the normal full convex appearance below the internal condyles there is on each side an elongated concave appearance, which is a constant and important phenomenon in such cases.

The explanation of the position of the hand with its loss of movement is simply due to wasting of certain muscles.

Extension of the metacarpo-phalangeal joints is brought about solely by the long extensors of the digits, and the extension of the digits themselves is brought about by the united action of these long extensors with the lumbricales, and to a lesser extent by the interossei. The lumbricales and interossei are also required to assist in flexion at the metacarpo-phalangeal joints along with the flexor profundus and flexor sublimis digitorum muscles.

Abduction and adduction of the fingers is performed by the interossei muscles.

The lumbricales have, therefore, the double function of flexing the first phalanx and extending the two distal ones.

The deep reflexes of the upper limb are very feeble indeed. Electrical stimulation of the wasted muscles gives no response to the faradic current.

There are no abnormal eye signs. The pathological lesion here must be situated in a part of the nervous system which affects motor power and nutrition of the muscles alone. We have here a pure case of progressive muscular atrophy, brought about by a degenerative change in the cells of the anterior horn, involving chiefly the 8th cervical and 1st dorsal segment of the cord, because the motor cells at these levels supply the small muscles of the hand and, to a certain extent, the flexors of the forearm, which are also affected by the degeneration present in higher cervical segments.

This disease, in its pure state, without accompanying degeneration in the tracts of the cord, is rare, and is usually associated with another pathological condition of the spinal cord which I shall demonstrate clinically in the next case.

I have now two more cases to demonstrate. At first sight they seem to have a somewhat similar condition of a milder type to the last case, but on closer examination one can readily see differences of such a kind as to give two other pathological pictures.

CASE V.—This man, a labourer aged 30, had to give up his work because of increasing weakness of his hands and forearms. He looks a strong healthy man, but on examining his hands we find both are wasted, particularly in the thenar and hypothenar eminences. Fine fibrillary tremors are seen passing over the wasted regions. There is some atrophy of the ulnar side of the forearms and all movements of the fingers are weakened, especially those of abduction and adduction. The case, so far, presents similar features to those which our last patient might have shown years ago before so much wasting had taken place.

We shall now go a step further and test the reflexes of both upper arms. All jerks are markedly exaggerated. There are no sensory changes in the arms. The deep reflexes of the lower limb are much increased, and both plantar reflexes show a well-marked Babinski sign.

Here we are dealing with a case of amyotrophic lateral sclerosis.

The increase in the deep reflexes and Babinski's sign are due to the degeneration taking place in the crossed pyramidal tracts at or about the same level as the anterior horn cells are degenerating. It is claimed by some that no case of pure progressive muscular atrophy exists, and that they are all cases of amyotrophic lateral sclerosis, in which the degeneration of the horn cells is so

much in advance of the sclerosis in the pyramidal tracts that the muscular degeneration prevents exaggeration of reflexes.

The last case also presents two wasted hands, and again the pathological lesion differs from any of those already shown.

CASE VI.—This patient, aged 40, had a fall on the back of his head when a lad, but did not thereafter complain of any symptoms, except an excessively free perspiration on the left side of his face and neck. A year or two ago he complained of stiffness in his lower limbs, and noticed weakness and wasting of his hands and a corresponding loss of power. The stiffness and difficulty of his gait has increased greatly the last few months.

The wasting of the hand is again seen best in the thenar and hypothenar eminences. The reflexes of the upper limb are a little increased, and on testing the deep reflexes of the lower limb they are much increased. Babinski's sign is present. On testing his sensations we find tactile and painful stimuli are impaired, and his power to distinguish hot from cold, in the upper limbs and back, is abolished.

The case should therefore be regarded as one of syringomyelia, where there is a gliosis of the spinal cord placed centrally and ultimately breaking down and giving rise to a cavity formation. This takes place most frequently in the lower cervical and upper dorsal region, as in this case. The failure to differentiate between heat and cold is explained by the fact that the fibres carrying thermal impressions cross in the cord immediately after they enter, and sensory impressions carried by these fibres are cut off by the tumour- or cavity-like formation. The weakness and wasting in the hands are accounted for by the fact that this gliosis presses on the anterior horn cells in the lower cervical and upper dorsal segments. The marked spasticity is due to the pressure exercised on the crossed pyramidal tracts. The excessively free perspiration is probably due to the paralysis of the sympathetic fibres as they run down the cord to emerge by the 1st dorsal root.

These cases illustrate certain diagnostic problems which may be met at any time in general practice. They can be easily worked out, in typical cases, by making a complete examination of the patient, and keeping in mind the possibilities of the various pathological causes bringing about wasting of the hand.

CLINICAL RECORDS.**TWO CASES OF BRONCHIECTASIS (NON-TUBERCULOUS)
TREATED WITH AUTOGENOUS VACCINES.**

By ROBERT A. FLEMING, M.D., F.R.C.P.,
Physician, Royal Infirmary, Edinburgh ;

and

HENRY J. C. GIBSON, M.B., Ch.B.,
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CASE I.—B. M'G., æt. 23, a miner, was transferred to the side room of Ward 27, Royal Infirmary, in the end of September 1914.

Two and a half months previously he had been admitted to Mr. Wallace's wards suffering from an attack of appendicitis. The appendix was removed on the day of admission, and the wound healed by first intention.

At the same time it was discovered that there was a fairly extensive area of dulness at the base of the right lung, with diminished expansion, and very distant breath sounds. As there was some suspicion of the presence of an effusion, a record syringe was introduced and some purulent fluid was withdrawn. The temperature soon began to assume a hectic type, rising to about 102° F. in the evening, and falling slightly below normal in the morning, while the respirations increased to 40 per minute.

In the beginning of August Mr. Wallace removed a portion of the right 7th rib, but only a very small quantity of fluid, clear in nature, was withdrawn. No benefit followed the operation, and the patient continued to expectorate an increasing amount of sputum, with a persistent troublesome cough, while his temperature swung to a greater degree than before.

Towards the end of September the patient was spitting large quantities of fetid sputum, generally bringing up more than a mugful (10 ounces) in the 24 hours, while he had bouts of coughing, lasting from half an hour to 3 hours, which greatly interfered with sleep.

When he was admitted to the side room of Ward 27 his weight was 8 st. 11½ lbs., his height being 5 ft. 10 ins.

His fingers showed definite clubbing. He had a leucocytosis of 40,000, mainly polymorphs. He was perspiring freely during the night, and his temperature swung as just described.

His chest had been well formed, but was definitely flattened, especially on the right side, and the excursion was limited.

At the right base there was a considerable area, extending from the 3rd rib downwards, which was dull on percussion. Vocal fremitus and vocal resonance were diminished, and the breath sounds were distant. These phenomena were mainly due to thickened pleura, but there were well-marked signs of bronchiectatic cavities in the region of the right scapula, extending as far up as the 3rd rib. Over these cavities the breathing was low pitched, bronchial, with many moist sounds, and increased vocal resonance.

On radiographic examination Dr. A. M'Kendrick described the appearance

as showing "Branching shadows in right lung, corresponding to distribution of bronchi, with localised and well-defined more or less circular shadows. Radiographically difficult to tell whether branching shadows are thickening of walls due to chronic bronchitis or to secretion inside the bronchi, associated with bronchiectasis. No cavities visible."

We determined to try the effect of an autogenous vaccine, and the patient was made to wash out his mouth thoroughly and then to spit into a sterile test-tube. The pathological report of the sputum—supplied by Dr. W. R. Logan—states :

"The organisms are pneumococci, streptococci, staphylococci, and micrococcus catarrhalis, with some Gram-negative bacilli, which did not grow on culture. Vaccine contains about 50,000,000 staphylococci and 100,000,000 micrococcus catarrhalis. Initial dose, c.c. $\frac{1}{2}$."

While the vaccine was being prepared the patient was taught how to perform postural coughing, and marked relief followed this procedure, although at this time, in order to obtain sleep, Brompton mixture had generally to be administered.

The vaccine treatment was begun on the 9th October, and increasing doses were administered hypodermically every 8th or 9th day. The increase was each time $\frac{1}{2}$ c.c. more than the previous dose. As a general rule the patient had no reaction, but on one occasion he felt "heavy and out of sorts" on the following day.

There were no signs of improvement in the physical or general condition until after the third dose of the vaccine had been administered, at which time he was bringing up a larger amount of sputum than he had done before, but the attacks of coughing were not so paroxysmal, and the shortness of breath became less pronounced. The temperature swung a little less vigorously. His weight was unchanged.

About the middle of November, when he was getting 1·2 c.c. of vaccine, there was definite evidence of improvement. He felt and looked better, although still thin and anæmic. He began to spit much less, the amount being reduced to about one-third of what it was before treatment; he slept better, and the night sweats ceased. His leucocyte count was now normal, and his respirations had diminished from 40 to 24 to the minute. He had gained $\frac{3}{4}$ lb. in weight.

At the beginning of December the first stock of vaccine was exhausted, and a second autogenous vaccine was obtained, the organisms, according to the pathological report, being slightly different, and including—"Pneumococci, streptococci, micrococcus catarrhalis, bacillus of Friedländer and staphylococci.

"Vaccine is made from *all* the organisms growing on blood-agar plate, and is therefore not standardised.

"Initial dose, half last dose of preceding vaccine."

This vaccine seemed to suit the patient even better than the first. In less than a week after the first injection he was able to get up, and his symptoms greatly improved. Our impression was that his cough and expectoration would have ceased entirely had it not been for the frightfully strong black tobacco which he persisted in smoking, and which certainly seemed to have a bad effect on his cough. There were still a few moist sounds to be heard over the right base.

On the 16th December 1914 he was sent to Ravenscroft Convalescent Home, and remained in the country for fully a month, during which time the injections

were continued, and when the patient returned to hospital for a few days before going out to resume work he had put on 3 stones in weight. He had no cough, no expectoration, and no pain, and the lung on the right side had absolutely dried up. There was great improvement as regards the respiratory excursion of the right lung. The temperature was subnormal, pulse 70, and the respirations 20 to the minute, and the clubbing of his fingers had to a great extent disappeared.

He was advised to try an out-door life in preference to his previous work in the pits.

In this patient's case, when he was admitted to the side room of Ward 27, everyone who saw him believed that he could not long survive, and that the duration of his life was probably a matter of weeks. All kinds of remedies were administered before the vaccine treatment was adopted. It was striking to note the difference as regards improvement from the use of the second, as distinct from the first, vaccine.

CASE II.—M. M'K., *æt.* 12, schoolgirl, was admitted to Ward 27, Royal Infirmary, Edinburgh, on 11th January 1915.

Her complaint was a "cough," lasting for 4½ years, and a "bad spit," with a duration of two years.

In infancy she had an attack of measles, but made a very good recovery, and was well until the summer of 1910. Her illness began with an ordinary cold, for which she was confined to bed for two or three weeks. No doctor was in attendance, but it seems probable, from the history given by the patient, and from that obtained from her friends, that she may have had dry pleurisy. There was an account of a sharp stabbing pain in the right side, aggravated by coughing, and she said she felt very ill.

She returned to school, but was often absent, feeling out of sorts, although not confined to bed. Ever since she has had a slight cough, but no amount of expectoration, until two years ago, when she spat up a considerable quantity of thick tenacious sputum, often so difficult to bring up that it made her sick. At the same time she frequently had a sharp pain in the right side, made worse on coughing. The attacks of coughing were more marked in the early morning or during the night. During this time she continued to attend school.

Her mother took her, in the end of December 1914, to see a doctor for the first time. She had been confined to bed for two days with pain in the right side of her chest, with inability to retain food, owing to the severity of the cough, and she was sweating profusely at night. A diagnosis of bronchitis was made, but as she did not improve, her mother brought her to the Medical Out-Patient Department of the Royal Infirmary, Edinburgh.

The girl was not favourably situated as regards home conditions. She was small and poorly nourished. Her height was 4 ft. 3½ ins., and her weight 4 st. 10 lbs. She was pale in colour, except when her temperature rose at night and her face flushed. The temperature swung from below normal up to 101° F., or even higher, at night. Her pulse was 108, and her respirations 30 to the minute. The fingers and toes were distinctly clubbed, the latter to a less extent than the former. She had a degree of ichthyosis, more obvious on the knees and elbows, but present over the whole body. Notwithstanding this, she sweated profusely during the night.

On examination of the respiratory system we noted that the patient was hoarse, and had partial loss of voice. Her chest was fairly well clothed; the ribs present evidence of rickets. Movement is much restricted on the right side, and at first the physical signs seemed to suggest a pleurisy with effusion, but no fluid was obtained with a record syringe.

There was evidently thickening of the pleura, but the chief point was the bronchiectatic dilatations present at both bases, but especially the right, over which the breath sounds were distant cavernous in character, and there were many moist râles on coughing. The sputum was tenacious, greenish in colour, the amount expectorated in the 24 hours being about half a mugful (5 ounces), and owing to its odour it was necessary, to prevent discomfort to the patients in the neighbourhood, to volatilise sanitas beside her bed.

An autogenous vaccine was obtained, and the report on the sputum by Dr. Logan was as follows:—"Cultures show staphylococci, streptococci, pneumococci, catarrhalis group, Friedländer's group, and short Gram-positive bacilli (unidentified).

"Vaccine, initial dose not more than $\frac{1}{10}$ c.c., increasing as borne by patient."

Ten tubes of vaccine were sent, and the treatment was begun on the 22nd January 1915, and continued for a period of ten weeks, the vaccine being administered every eighth day. The initial dose was 0.1 c.c., and increasing by 0.1 c.c. until, on the 26th March 1915, 1 c.c. was administered.

This patient was kept in hospital for about ten days before the vaccine treatment was commenced, and, instead of gaining by dietetic and other measures, seemed to be losing ground, her temperature rising to 102.6° F., and the respirations to 43 on the evening before the vaccine was injected for the first time.

After each dose of vaccine there was generally a temporary improvement in her symptoms, and this period of relief became gradually greater as each dose of vaccine was administered.

In the second week of February the patient was spitting up about half the original quantity of sputum, and the odour had disappeared, so that sanitas as a disinfectant was no longer necessary. Notwithstanding this improvement the patient's weight gradually diminished, and she lost 2 lbs.

When the fourth dose was administered the temperature rose 2½°, the pulse was 110, and the respirations 32 to the minute. The temperature fell gradually to normal, although the respirations remained high for a full week. It is probable that during this period the patient suffered from an attack of influenza.

After the sixth dose the temperature became subnormal night and day, the pulse about an average of 80, and the respirations 24 to the minute. She was now allowed to get up, and soon began to put on weight, and continued to do so until she was sent away from hospital.

In the beginning of March the girl appeared healthy, had no expectoration, and only a slight and very occasional cough at night time, while sweating had completely ceased. In the end of March the patient was examined for the last time before she was sent out, and it was found that there were no moist sounds heard anywhere over the chest. Her weight was 4 st. 12½ lbs., so that she had regained all the weight previously lost and added some 2 or 3 lbs.

In this case there was certainly less sputum, but what there was

had a more offensive odour than in Case I. There was not the great increase in weight during treatment, but the patient had been continuously in hospital, and had no country air as a helpful factor.

There is probably no disease which is so hopeless as bronchiectasis unless treated with a vaccine, and a vaccine is of special value where no tubercle bacilli are found in the sputum. The sputum in both the cases here recorded was repeatedly examined for tubercle, and invariably the result was negative. Obviously, if after repeated microscopic examination there are no tubercle bacilli, an autogenous vaccine should be at once obtained. One of us can recall many cases occurring in his experience prior to the days of vaccine therapy which might have been saved many years of ill-health by this treatment.

NOTES ON THREE CASES OF MALIGNANT PUSTULE OF ANTHRAX.

By ALEXANDER MILES.

THE diagnosis of the fully developed malignant pustule of anthrax is attended with little difficulty if a clear history of a possible source of infection is forthcoming, and it can be made with certainty when confirmatory evidence has been obtained by examination of the material suspected of having conveyed the infection. In the absence of such direct proof, the occupation of the patient may be presumptive evidence of the nature of the condition, even although there is no indication that he has been in contact with anthrax-infected animals or material. One or other of these groups of circumstances were present in most of the cases reported here and in Mr. Dowden's record which follows. In the others the diagnosis was made from the characteristic appearance of the local lesion, and was confirmed by bacteriological examination. The first two cases illustrate some of the difficulties in obtaining a clue to the source of infection.

The number of cases here reported is much too small to warrant any conclusions with regard to treatment. The only case (Case III.) in which Selavo's serum was employed without further local treatment than the purification of the pustule with antiseptic lotions recovered. An equally satisfactory result was obtained in a man who was infected from the same source and who was treated by scraping the local lesion and applying pure carbolic acid to the raw surface (Mr. Dowden's first case).

CASE I.—*Malignant Pustule of Neck—Excision—Recovery.*—Late on a Saturday afternoon in the summer of 1903 a miner from one of the adjacent counties appeared at the Royal Infirmary in his working clothes just as he had left the pit. He explained that on his way home from work he had called on his doctor with regard to a swelling which had appeared on the side of his neck,

and that he had been told to go to the Infirmary with all possible speed as the condition was a serious one. He said that he had felt ill all day, and that a small pimple which appeared on the side of his neck in the morning had rapidly increased in size, and that the whole neck and side of the face had become swollen.

The man looked ill; his pulse was feeble and rapid, and the temperature was over 103° F. The neck was markedly œdematous, particularly on the left side, and the swelling extended on to the side of the face. Over the lower third of the left sterno-mastoid was an indurated nodule covered by a dark brown crust, and around this a series of bluish vesicles. The local lesion presented all the appearances of the malignant pustule of anthrax, and Dr. Theodore Shennan, who was kind enough to come up and examine the fluid from one of the vesicles, found it contained anthrax bacilli. (Subsequent cultural results confirmed the microscopic examination.)

The affected tissues were freely excised by elliptical incisions, and the wound, after being painted with pure carbolic acid, was packed with iodoform gauze and dressed. Next day the patient felt better, and the pulse and temperature had fallen nearly to normal. The œdema quickly disappeared, and the wound gradually healed, leaving comparatively little disfigurement from the scar.

The special interest of this case lies in the mode of infection. It appeared unlikely that a miner would be exposed to infection with anthrax in the course of his work in a coal pit. It was evident, moreover, that in replying to our questions with reference to other possible sources of infection the man was fencing. The readiness with which he had complied with his doctor's advice to travel to Edinburgh without even washing and changing from his working clothes further raised our suspicions that he knew more about the cause of his illness than he cared to confess. On being pressed, he admitted that previous to working in the pits he had been a butcher, and that a few days before he took ill a former employer in a neighbouring town had sent for him with the request that he would come and help him to "dress" the carcase of an animal which had died suddenly in one of his parks. This he did without, he said, asking any questions. We subsequently learned that the meat was disposed of to the skippers of small coasting vessels, and, so far as our inquiries went, no harm seems to have come to any of the crews who presumably consumed it. The matter subsequently came before a committee of the local authorities, and was disposed of by the following ingenious argument:—"Any man who contracts anthrax inevitably dies. This man did not die. Therefore the animal which he 'dressed' did not suffer from anthrax." In this opinion the committee, chiefly composed of farmers, unanimously concurred.

CASE II.—*Malignant Pustule of Neck—Excision—Recovery.*—The patient, John H., a well-built man of 52, applied at Leith Hospital for advice regarding a painful swelling of the left side of the neck on 27th February 1904. His story was that six days previously there appeared on the side of the neck a small pimple which he took to be a boil—a condition from which he had frequently

suffered during the previous two or three years. The following day, in the course of his work as a vanman, while carrying bags of sugar on his shoulder, the head was knocked off the pimple and some pus escaped. For the next few days he was employed carting goods of various kinds from the docks, and the pimple was repeatedly irritated by contact with heavy loads carried on his shoulder. Three days before he came to the hospital the parts around the pimple became greatly swollen and the neck became stiff and painful. The swelling rapidly spread till it involved the whole of the neck, and he began to feel generally out of sorts. He continued at his work next day, however, but as the swelling was spreading towards the shoulder, and he was feeling ill, he consulted Dr. H. G. Langwill, who sent him at once to the hospital.

On admission, a black eschar about the size of a three-penny piece was found on the left side of the neck about an inch and a half below the lobule of the ear: it was surrounded by a ring of small vesicles and a zone of hyperæmia (Fig. 1). The whole of the left side of the neck was œdematous and brawny and the seat of considerable pain. The pulse was 104, the temperature 103° F., and he looked ill. Cultures were made from the contents of the vesicles and from the blood, and Dr. W. T. Ritchie subsequently reported that those made in agar from the contents of the vesicles showed a pure growth of bacillus anthracis, while those from the blood were sterile.

The local lesion was purified and antiseptic dressings applied. The next morning the eschar had increased to about the size of a shilling, a ring of large purulent-looking vesicles had formed round it, and the œdematous swelling had spread right round the neck, on to the face and down over the shoulder and front of the chest. The pulse was still 104 and the temperature 103° F., and the patient had the appearance of being profoundly poisoned.

The local lesion was freely excised by elliptical incisions. The subcutaneous tissues were so œdematous that the sterno-mastoid muscle was quite an inch and a half from the surface. In the vicinity of the lesion the tissues had a gangrenous appearance and the bleeding was comparatively slight. The wound was left open, dusted with ipecacuanha powder, and covered with a gauze dressing.

The following day the wound looked clean, and the œdema was subsiding, but the pulse was 116 and the temperature 103° F. The bowels were acting freely, as were also the kidneys, but the patient was persistently sick. This ceased, however, after the stomach had been washed out, and the next day the pulse had fallen to 108 and the temperature to 99° F. On the third day the pulse was 84, the temperature normal, and the wound going on satisfactorily. The œdema rapidly disappeared, and the wound healed without further complications in about three weeks.

On inquiry at the docks it was found that the day before the symptoms became acute the patient was carrying empty bags to the rag-store, and that these had been lying in the shed beside a consignment of hides from Russia. It seems probable, therefore, that the open pimple had been infected with anthrax spores conveyed from the hides to the empty bags which he had carried on his shoulder.

CASE III.—*Malignant Pustule of Forearm—Treated by Sclero's Serum—Recovery.*—This patient, who was a butcher in a small town, developed what at first he took to be a boil on the outer aspect of the right forearm a little below the elbow. As it increased in size rapidly, and was attended with con-

siderable swelling of the whole upper extremity, he became alarmed about it. His anxiety was increased by the recollection that some days previously he had been asked by a farmer in the district to dress a bullock which had died suddenly. In doing this he had noticed that the spleen of the animal was abnormally large, and had called the attention of the cattleman to the fact. The veterinary inspector, who was sent for, pronounced the case to be one of anthrax, and ordered the carcase to be burned.

The patient was not aware of any abrasion of the skin where the "boil" appeared, but it happened to be at the site of the scar left by a wound which had been healed for five years. His attention was first called to the condition by a burning sensation in the part, not amounting to pain, and by a firm nodule, red on the surface and slightly tender, about the size of a sixpenny piece, with considerable swelling of the soft tissues round about it. A blister formed over the central part of the swelling and burst. At this stage the sore was burned with blue stone. Next morning there was a black eschar about the size of a shilling over the central part of the lesion, and a series of dark blisters round it, and the swelling of the upper extremity from the wrist to the shoulder was so great that he could not get on his jacket (Fig. 2). As his pulse had risen to 106 and his temperature to nearly 100° F., he was sent to the Royal Infirmary.

On admission he looked, although he did not feel, ill. The local lesion was characteristic of the malignant pustule of anthrax, and this, together with the history he gave, left no room for doubt as to the diagnosis, which, however, was confirmed by microscopic as well as by cultural observations.

The local lesion was purified with antiseptics, and 40 c.c. of Selavo's serum were injected subcutaneously into the abdominal wall. In the evening the temperature had risen to 101.2° F., the pulse had fallen to 100, the pustule had increased in size, and the œdema was more marked, and had spread on to the chest-wall. Next evening he became excited, and during the night was so violently delirious that it was necessary to inject morphine and hyoscine repeatedly to keep him quiet. During the next two days the pustule continued to increase in size, and an irregular eschar about the size of a half-crown piece formed. This was surrounded by large vesicles, the contents of which were hæmorrhagic. A further injection (20 c.c.) of serum was given. The delirium was now passing off, the temperature was normal, and the pulse 80.

Five days after admission the pustule was perfectly dry; no further vesicles formed, and the œdema began to subside. The patient was now quite sensible, felt well, and took his food with relish. From this time onwards he made a satisfactory recovery. The scab separated in the course of about a fortnight, and the sore gradually healed, leaving a slight scar. No anthrax bacilli could be found in the scab or in the serous discharge from the sore.

The interest of this case is increased by the fact that a few days later the man who had bled the animal from which the infection arose was admitted to the wards of my colleague, Mr. J. W. Dowden, suffering from malignant pustule of the neck. The lesion was treated by local measures alone, and the patient recovered. The record of this case is included in Mr. Dowden's notes below.



FIG. 1.

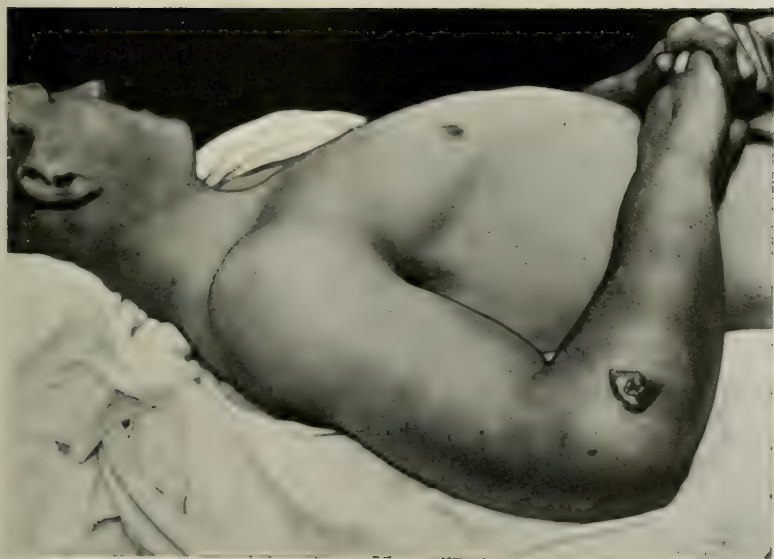


FIG. 2.

NOTES ON THREE CASES OF MALIGNANT PUSTULE
OF ANTHRAX.

By J. W. DOWDEN.

THE following notes of three cases of malignant pustule may be of interest. In the first case the infection occurred from the same source as one of those reported above by Mr. Miles.

CASE I.—A shepherd, aged 32, was admitted to the Royal Infirmary complaining of "swelling in the neck." The right side of the face and neck showed marked redness and swelling, which obliterated the contour and culminated in an area below the angle of the jaw, with a blackened surface and surrounding vesication; in all about the size of a penny. Temperature, 101·8° F.; pulse, 84; respiration, 24. The condition was obviously, both by inspection and palpation, a case of anthrax.

The history was that on 23rd February a bullock had died after being ill for a short time, and he had bled the animal by cutting its throat. He was not aware of any bruise or cut or localised infection while bleeding the animal. He remained well until 4th March, and noticed only a small, itchy pimple on the side of the neck, but otherwise he had no symptoms except swelling, which came on and increased rapidly.

He was admitted to the Infirmary on 8th March. The treatment adopted was immediately to scrape the whole surface with a sharp spoon, to clip away the central black area which was most adherent, and then to apply pure carbolic acid.

At 7 P.M. the same evening the temperature was 104·8° F., but he felt very well, and his pulse was only 104. By the 10th of March his temperature and pulse were normal, and the swelling of the neck had almost gone, but the cauterised area was still quite black. His general condition was excellent and the local condition improved rapidly, so that on the 29th the black eschar had almost entirely separated, and he was discharged. Since then he has remained well.

The bacteriological investigation was carried out from the original scraping, and the report issued on the 10th by Dr. Shennan was as follows:—"In films Gram-positive large rods, and staphylococci, but only the staphylococci have developed on cultivation. Morphologically, rods are like anthrax bacilli." From this report it would appear that the active anthrax organism had been mainly destroyed before the patient's admission to hospital.

My personal experience of anthrax is limited to two other cases, of which the following are the main facts briefly:—

CASE II. was that of a man who had skinned an animal nine days before he was admitted to the Infirmary. He knew the animal was infected with anthrax by the size of the spleen and from having skinned animals with anthrax before. Six days after the skinning process a pimple appeared on his forearm which was very itchy, and as this got much worse, with marked swelling, he was sent to the Infirmary. When seen, the arm was much swollen, red, and oedematous, and on the front of the forearm there was a small, black, dry scab about 1/2 inch

in diameter, with a surrounding area of bluish-black vesicles and numerous larger blisters which, he said, were caused by turpentine stupes. The glands in the axilla were much enlarged. His temperature was 100·4° F. and his pulse 116. Chloroform was administered and the whole area freely excised, and the large surface swabbed with pure carbolic acid. Three days later his pulse was normal, the excised surface was clean, and the œdema had almost disappeared; at the end of a week the surface was nearly healed, and he felt perfectly well. Active anthrax bacilli were grown from the fluid in one of the bluish-black vesicles.

CASE III. came to my notice some years ago, but unfortunately the notes are not at present to hand. The main facts were that the patient, an elderly shepherd, had noticed an itchy pimple on the back of his hand, and this developed into a small black scab with vesicles round it. The patient's doctor in the country, recognising the condition, applied pure carbolic acid and sent him into the Infirmary next day. No growth was obtained from the surface, and the patient's condition had improved so much in the intervening time that nothing further was done, and he made a rapid recovery.

OBITUARY.

HENRY MACDONALD CHURCH, M.D., F.R.C.P.

ON Tuesday, 3rd August 1915, after a short illness, Dr. Henry Macdonald Church, having completed full forty years of devoted, sympathetic but unobtrusive medical work in Edinburgh, entered into rest and into that life of higher service to the attainment of which he had assiduously pressed forward.

He was born at Dalhousie sixty-six years ago, being the eldest son of Mr. Duncan Macdonald Church. During his undergraduate course he lived at Ferniehill, Liberton, where his father had taken up residence when he retired from farming. The writer has memories of many pleasant walks with Church in the afternoons after Professor Turner's demonstrations. During these peregrinations the whole of the demonstration of the day was gone over and the walk was continued till the subject was satisfactorily revised. Church graduated B.Sc. in 1871 and the following year he took his M.B., C.M. degree. He then spent some time as assistant to Dr. Shand of Kirkcudbright, and during the winter session he acted as junior Demonstrator of Anatomy to Professor Turner. His next appointments were in the Royal Infirmary as Resident to Professor Annandale and later to Sir Thomas Grainger Stewart. He then went to Vienna, Berlin, and London for special studies, and on his return home acted for a short time as assistant to Dr. Brotherston of Alloa. Dr. Shand, whom he had assisted for a short time in 1872, was anxious that Church should again go to Kirkcudbright, but he had decided to try his fortunes in Edinburgh, and put up his plate at 18 George Square in 1875. His patients were not slow to discover that in him they had not only an able and painstaking doctor but a sympathetic friend and a wise counsellor, consequently he rapidly acquired a large general practice.

When a student Church became a member of the Royal Medical Society; he was afterwards elected one of its Presidents, and he maintained throughout his life a warm interest in that oldest of medical societies. In 1879 he was elected a Fellow of the Royal College of Physicians. He took an active part in the work of the Medico-Chirurgical Society and also of the Obstetrical Society, and occasionally made communications to them, and on more than one occasion articles by him appeared in this *Journal*. In 1903 he read, before the latter Society, a paper of considerable importance on "Overlapping of Pregnancy and Lactation." The value of the paper was partly due to its being based upon facts observed by himself in a series of seven cases. He pointed out the dangers to the mother, the suckling, and the embryo.

Another valuable communication was on "Rheumatoid Arthritis." He discussed its etiology and showed that on chemico-physiological grounds a liberal diet is important in treatment. On two different occasions the Obstetrical Society asked him to occupy the Presidential chair, a position which he would have adorned, but on each occasion he declined the honour, on the ground of health; but he retaliated by presenting to the Society a very handsome chair for the use of future Presidents.

Dr. Church was most highly appreciated by those who knew him most intimately. He was a warm-hearted, staunch friend, a good man, sympathetic, generous, who, although he had a high standard of morals, was ever ready to excuse the failings of others. The writer cannot recall a single instance in which Church made an unkind remark about anyone. He had a fine imagination, a poetic mind, was a great lover of Nature, particularly attracted to botany. When in 1907 the University of Upsala determined to celebrate the bicentenary of the great Swedish botanist Linnaeus, Dr. Church accepted with alacrity the suggestion of the Royal College of Physicians that he would be one of the two representatives of the College at these celebrations. Linnaeus and Boerhaave were two of Church's heroes. He loved to study their lives and work.

The anxieties of medical practice weigh heavily on those of sensitive, sympathetic nature. The strain of work told on Dr. Church, and some years ago he thought it prudent to take a prolonged rest and thereafter to limit the engagements which he undertook. That holiday he devoted assiduously to literature. He was a great lover of books. His chief recreation was golf. He more or less regularly went with one or other of his friends for an easy game. Dr. Webster was his most frequent companion. He never allowed botany, science, literature, or even golf to interfere with duty; he always gave his patients of his best. A large circle of friends and patients will greatly miss his kindly presence and his wise counsel.

In 1879 Dr. Church married Miss Cochrane, daughter of the Rev. Dr. Cochrane, minister of the First Charge, Cupar, Fife, a lady of peculiarly sweet and winning personality. She had one son, who is now Captain I.M.S. He was recently wounded in action in Persia, but has now recovered. Mrs. Church died in 1881. In 1888 Dr. Church married a daughter of Mr. George Slight, who was at one time a partner in the firm of Neill & Co., printers, and afterwards agent of the Newington Branch of the Bank of Scotland. Mrs. Church possesses similar tastes and qualities of mind and heart to those which distinguished her husband. She proved a most devoted and affectionate mother to Dr. Church's young son. She and a daughter as well as Captain Duncan Church, survive the husband and father.

J. R.



THE LATE DR. CHURCH.

RECENT ADVANCES IN MEDICAL SCIENCE.

MEDICINE.

UNDER THE CHARGE OF

W. T. RITCHIE, M.D., EDWIN MATTHEW, M.D., J. D. COMRIE,
M.D., AND A. GOODALL, M.D.

PATENCY OF THE DUCTUS ARTERIOSUS.

GRIFFITH records two cases (*Quart. Journ. Med.*, April 1915) in which this rare affection was diagnosed during life. In the one case, a woman, aged 32, the signs upon which the diagnosis was made were a loud systolic bruit at the inner end of the second left intercostal space, followed by a very loud diastolic bruit audible a considerable distance outwards along the second space and not transmitted along the left edge of the sternum; also a greatly accentuated second sound: these two phases appeared to be one murmur with no interval between them. There was no cyanosis. After death, which was due to infective endocarditis, the ductus arteriosus was found to be sufficiently large to admit a No. 9 catheter. The other case, a boy of 5 years, had a systolic bruit louder in the aortic and pulmonary areas than at the apex; there was some cyanosis and clubbing of the fingers, together with enlargement of the heart. This boy was again seen when aged 13 years, and presented then a continuous humming sound at the inner end of the first right space, with systolic and diastolic increments. As the result of a radiosopic examination a diagnosis of transposition of the aortic arch to the right side was made, together with patency of the ductus arteriosus.

THE PITUITARY GLAND IN DIABETES MELLITUS.

Fry publishes (*ibid.*, July 1915) a histological study of the condition of the hypophysis in diabetes mellitus and in various conditions of the other internally secreting glands. The usual change as regards diabetes was the presence of adenomatous masses of eosinophilic cells, colloid invasion of the anterior lobe, and areas of cellular degeneration. He found practically no changes accompanying pancreatic diseases, nor in cases of Addison's disease or in cases of status lymphaticus. On the other hand, in conditions affecting the thyroid gland the pituitary showed marked changes; thus in goitre there was hyperplasia of the chromophil cells, especially of the eosinophilic glandular cells, and increase of colloid in the interglandular cleft; while in myxœdema there was increase in weight of the pituitary due to increase of the connective tissue and hyperplasia of the chief cells. The writer considers that the eosinophil and granular cells represent a stage of

active secretion, and that colloid is formed from these granules. This material later passes back into the posterior lobe and so by the infundibulum into the cerebro-spinal fluid.

ACHALASIA OF THE CARDIA.

Hertz (*ibid.*) draws attention to the condition of absence of relaxation of the cardia, leading to hypertrophy and dilatation of the œsophagus, for which he proposes the name of achalasia instead of cardiospasm, as he does not consider there is really a spasm involved. The condition, he finds, may begin at any age, and in his own six cases the ages were 26, 30, 36, 40, 48, and 65, while cases have been recorded beginning at 8 and 70 years of age. The symptoms begin gradually, a slight attack, lasting for a day or two, being followed by a period of freedom for a few days or weeks, other attacks occurring at gradually shortening intervals until the condition becomes permanent. The attacks often begin in the morning with difficulty in swallowing saliva; the food appears to stick at the lower end of the sternum, and salivation occurs in almost every case, the saliva being frothy, mucous, and very copious, up to 10 ounces nightly in one case. After a certain amount of weight is lost the patients appear to develop a state of equilibrium, in which they may continue for many years, although they constantly regurgitate a large proportion of the food they take. Diagnosis may be made from the patient's description of his symptoms and is readily confirmed by X-ray examination. The only condition with which confusion may arise is cancer of the œsophagus, and in achalasia the intermittent character of the attacks, the evenness of the X-ray shadow, the facility with which a mercury bougie may be passed, and the protracted duration of the case form means of differentiation.

CEREBRAL ŒDEMA IN CHRONIC ALCOHOLISM.

Sceeleth and Beifeld (*Amer. Journ. Med. Sci.*, June 1915) describe a serious type of delirium tremens under the term of "wet brain," which, they say, has not been given much place in medical literature. After prolonged indulgence in alcohol they say, if delirium tremens develop, this is apt to be followed after the usual classic symptoms by a comatose state in which œdema of the brain has taken place. The symptoms are essentially meningeal, with semi-coma, generalised hyperæsthesia, and muscular stiffness, in which Kernig's sign, neck rigidity, etc., are prominent features; the more marked the latter two characters are, the worse the prognosis. The cerebro-spinal fluid is normal, but is usually under increased pressure when a lumbar puncture is made. The mortality is about 75 per cent. of cases, death being most commonly directly attributable to broncho-pneumonia. With regard to treatment, apart from free feeding with fluids and attempts

to increase elimination, little can be done. Dona commends lumbar puncture for its therapeutic effect, but the writers have not found it of great value. The lesion in the brain consists of a marked fluid accumulation in the pia-arachnoid space, with widening of the sulci and corresponding narrowing of the convolutions; in addition there is the usual increase in ventricular fluid and softness of the brain tissue as in oedema due to other causes.

CARCINOMA OF THE STOMACH.

Bloodgood (*Journ. Amer. Med. Assoc.*, June 1915) gives the results of observations based on 184 cases of carcinoma of the stomach which have been dealt with in the laboratory of the Johns Hopkins Hospital in the past 25 years. Of these cases 26 per cent. were operable by resection of part of the stomach, the remaining 74 per cent. were found to be inoperable. Of those occurring in the past five years, however, 39 per cent. have been operable, which appears to indicate a growing tendency to early diagnosis of this condition and recourse to surgical treatment. A curious point to which the writer draws attention is that when cases are classified according to the length of time during which continuous symptoms of pain, etc., have been present, the ratio of operable to inoperable cases remains about the same whether the duration be months or years. From this it follows, generally speaking, that cancer of the stomach does not always begin as cancer, and may in fact be preceded by simple ulcer. The greater number of cases, amounting to over one-third of the whole, had had a duration of from six months to one year prior to operation. Permanent cure resulted in three cases, of which two had lasted 7 months before operation and one 11 months. In the two former cases death occurred 7 years later from other conditions, while the last case is still alive 5 years after the operation.

TYPHOID CARRIER.

Sawyer (*ibid.*) records the case of a typhoid carrier who infected no less than 30 persons, of whom 5 died. This man was ill with typhoid fever from November 1907 to January 1908; thereafter for 4 years he worked on various steamers, but most of the time on the *Aeneas*. During this period he infected 27 officers and men, of whom 4 died. An investigation of his stools was made for two weeks in hospital in December 1911, but no bacilli were found; his faeces were again examined in March 1912, and were found to contain many typhoid bacilli. Between March and October 1912 specimens of faeces were examined weekly and the typhoid bacillus was isolated twelve times; examination of the urine, however, consistently gave negative results. Various attempts were made to cure him, amongst other means an autogenous typhoid vaccine was tried between April and

June 1912. Subsequently the patient was kept in hospital from June to October 1912 and his stools regularly examined for typhoid bacilli with, however, negative results. He was therefore released from hospital, but continued to report monthly for the purpose of having a stool examined. During the next three months he infected three more persons working on the same steamer as himself, of whom one died. The fæces were examined 4 times, on 3 of these with negative and on one with positive results. His gall-bladder was now removed but was found to contain no typhoid bacilli. Again, 2 months later, typhoid bacilli were found in the stools. From April 1913 to April 1915 the fæces were examined 71 times, but upon only 3 of these occasions were typhoid bacilli found. Towards the end of this period stomach contents containing bile were examined and found to contain typhoid bacilli; also it was found that the fluid stools following administration of podophyllum or cascara and magnesium sulphate contained great quantities of these bacilli. Apparently this carrier could be controlled only by quarantine.

J. D. C.

SURGERY.

UNDER THE CHARGE OF

J. W. STRUTHERS, F.R.C.S., AND D. P. D. WILKIE, F.R.C.S.

BLOOD TRANSFUSION.

R. OTTENBERG and E. Libman (*Amer. Journ. Med. Sci.*, July 1915) made a clinical study of 212 cases treated by blood transfusion. The cases were observed by themselves and presented a great diversity of conditions. From their observations the authors draw certain conclusions as to the special indications for, and general management of, blood transfusion.

It is stated that 42 of the cases were successful, 29 recovering completely, and the remaining 13 being saved from immediate death. Cases in which transfusion did no good or in which the continuation of the original disease caused death numbered 104. Of these 28 improved for a short time, and included cases of malignant tumours, pernicious anaemia, endocarditis, dysentery, and typhoid fever. Another group contained cases of acute leukaemia, typhoid perforation, diabetic coma, and uraemia, and the disease itself was so grave that transfusion could not have been expected to do much good. In 4 cases of post-operative shock and 6 cases of pathological hæmorrhage the results of transfusion were disappointing. In 2 of the unsuccessful cases a fatal result was hastened, probably by the transfusion of incompatible blood.

Special Indications.—Transfusion has been frequently found to be the means of saving life after simple hæmorrhage. It is pointed out,

however, that in acute hæmorrhage, where the bleeding point cannot be reached, as in gastric or duodenal ulcer, transfusion may raise the blood-pressure and result in further hæmorrhage. Hence in such cases transfusion should only be employed in order to save the patient from immediate exsanguination. In repeated or prolonged hæmorrhage, on the other hand, transfusion is beneficial and frequently checks the bleeding. In typhoid cases the first appearance of blood in the stools should be an indication to prepare for a transfusion. In the typhoid state transfusion may have life-saving value, and, according to the authors, should be more frequently resorted to. Transfusion is especially valuable in ruptured ectopic gestation, before operation in very exsanguinated patients, or after operation to hasten recovery. As a preliminary to operation in cases in a desperate state, and also for post-operative hæmorrhage, transfusion gave excellent results. The effects of transfusion on post-operative shock, however, were surprisingly unsatisfactory.

In purpura hæmorrhagica transfusion not only restored lost blood but in most cases resulted in prompt cessation of hæmorrhage. In hæmophilia transfusion is considered a specific therapy for the control of bleeding. Serum treatment was extensively tried and frequently found unsuccessful. The active ingredient of serum is thrombin, but this is neutralised by antithrombin circulating in the blood. Whole blood, on the other hand, supplies the body at once with all the substances in plasma, cells, and platelets necessary to elaborate thrombin at a distant bleeding point. The authors recommend that every hæmophilic should have at his command several persons whose blood by previous tests is known to be compatible with his own. When serious hæmorrhage occurs, prompt transfusion should be performed, preferably by the syringe method. For hæmorrhagic disease secondary to such conditions as pernicious anæmia, leukaemia, and nephritis, transfusion may be tried, but is not always successful. The results in post operative hæmorrhage due to cholæmia were especially discouraging.

For pernicious anæmia, transfusion is considered the best remedy. It never cures but it leads to remissions in about half of the cases. The authors maintain that transfusion should be resorted to early instead of late, and that it should be persistently repeated as often as is necessary to keep the patient from developing a marked grade of anæmia. Several cases of leukaemia were benefited by transfusion, the benefit being most marked in chronic cases.

In prolonged suppuration mere anæmia and exhaustion may be all that prevents the overcoming of infection, and in such cases transfusion of normal blood may offer an almost specific cure. They believe that there exists great possibilities in the treatment of infectious diseases by transfusion of blood from a donor previously immunised.

They recommend that cases of diseases, recovery from which confers lasting immunity, like typhoid fever and scarlet fever, should be asked to return to act as donors.

For intoxications in which the poison is contained in or has acted on the blood, transfusion is advocated, and should be preceded by a large phlebotomy. Such poisons are carbon monoxide, hydrocyanic acid, and benzol.

General Management.—Hæmolysis is considered the greatest danger, but can always be obviated by tests for hæmolysis and agglutination. The donor should be carefully examined to exclude infectious disease and his blood subjected to the Wassermann test. The majority of the transfusions were performed by the direct method—artery to vein or vein to vein. In the later transfusions the syringe method was used and found to possess great advantages over the direct method. It involves no trauma and very little pain, can be repeated as often as desired, and, moreover, the exact amount transfused is known. The newer procedures—Unger's modification of Lindeman's syringe method and the transfusion of citrated blood—were tried, and are now considered the methods of choice. The amount to be transfused depends partly upon the weight of the donor and the weight of the patient. For hæmorrhage, it has been found that a smaller amount than has been lost is sufficient to overcome the collapse. In hæmorrhagic disease 500 c.c. is usually enough, but in hæmorrhage due to cholæmia it is believed that a large transfusion, with perhaps a preliminary phlebotomy, is preferable. In pernicious anæmia a moderate sized transfusion (500 c.c. to 1000 c.c.) is probably sufficient. When repeated transfusions are made, the likelihood of hæmolysis occurring is distinctly greater in the second and third than in the first transfusion, and accordingly the tests for hæmolysis and agglutination must be carefully made.

R. Lewisohn (*Surg., Gynec., and Obstet.*, June 1915) describes his method of transfusion of citrated blood, and reports the result of twenty-two such transfusions.

By experiment he previously found that blood containing 0.2 per cent. of sodium citrate did not clot for three days. Ordinary amounts of blood used in transfusion could therefore be rendered non-coagulable without being toxic. The author further showed the interesting fact that the citrated blood, which does not coagulate outside the body for 2 or 3 days, does not retard the coagulation of the general blood volume. On the contrary, the coagulation seems to be temporarily hastened.

The chief merit of the citrated blood method as compared with other syringe methods is its relative simplicity. Apart from a marked transient polyuria in a few of his 22 recorded cases, the results were similar to those obtained by other methods of transfusion.

SPLENECTOMY FOR HÆMOLYTIC ICTERUS.

C. A. Elliott and A. B. Kavel (Surg., Gynec., and Obstet., July 1915) record eight cases of hæmolytic icterus. One of their cases was treated by splenectomy, and on this and other 47 similarly treated cases gathered from literature the authors base their remarks.

Clinical Features.—There are two types, one familial and the other acquired. The symptoms in the latter would seem to progress somewhat more rapidly, but in other respects the two types present a similar clinical picture. In the majority of cases the disease is mild in character and would pass unnoticed were it not for the icteric tinge of the skin. Such cases may live to old age and demand no therapy. Other cases are more severe. There is a chronic slight icterus with or without weakness and malaise. From time to time there are crises, characterised by marked increase in size and tenderness of the spleen, malaise, headache, a certain degree of fever, and an intense hæmolysis causing marked jaundice. There is urobilinuria. Although bile pigments are present in the blood, none occur in the urine. The liver may be slightly enlarged and tender, but these signs are not conspicuous. Unlike ordinary jaundice, there is no pruritis, no petechia, and no bradycardia. The stools are normal in colour unless "liver crises" arise as the result of passage of thickened bile and pigmented stones through the ducts, and such complications are not infrequent.

The tremendous hæmolysis seriously taxes the hæmopoietic system, which in time becomes exhausted, and there develops a clinical picture closely resembling that of pernicious anæmia. In cases coming to operation the erythrocyte count varied from a little below normal to as low as one million. The majority of cases presented the normal number of leucocytes, though in a few cases liver crises were accompanied by a leucocytosis. The fragility of the red cells is increased and can readily be tested by Chauffard and Widal's method. This fact is an important aid in diagnosis, as in obstructive jaundice, pernicious anæmia, and splenic anæmia the fragility is decreased.

The *pathological findings* in spleens removed showed the endothelium to be proliferated and filled with coarsely granular hæmosiderin. There was little, if any, proliferation of connective tissue. The pulp was frequently infiltrated and there was great loss in follicles, and at times dilatation of the spleen sinuses. Further, there was usually evidence of perisplenitis. At autopsies the liver showed little change apart from a deposit of iron and iron-free pigment. The bone-marrow presented evidence of great overaction.

The *pathogenesis* of hæmolytic icterus is very obscure. The older theories of liver origin must be discarded, although the liver undoubtedly plays a part in the disease process. Some authorities

maintain that the condition is really a blood disease, the chief factor being a decreased osmotic resistance of the red cells. Eppinger considers the essential etiological factor to be an altered splenic function. It is reasonable to assume that there is a constant abnormal hæmolysis with exacerbations. Whether the hæmolytic agent exists in the spleen or in the general circulation is not known.

Treatment is not called for in a great many of the cases, as the disease runs a mild course, and the patient may attain a good age without subjective symptoms. In severe cases iron, arsenic, and other drugs have been tried and found to be useless. Splenectomy, on the other hand, has resulted in remarkable benefit. The results in the 48 cases would seem to indicate that this procedure should be adopted, not only in severe cases but also in mild progressive types, to relieve disability and to obviate the onset of gall-bladder complications and severe hæmolytic crises.

It is recommended that care be taken to separate the tail of the pancreas before dealing with the splenic pedicle, and that the gall-bladder be examined lest perchance there exist gall-stones. In the author's case 10 m of 1:1000 adrenalin were injected prior to the operation in order to reduce the size of the spleen, but this is considered a doubtful procedure.

The *prognosis* after splenectomy is good. In spite of the fact that many of the cases operated on were in a serious condition, only two died, and one of the deaths was due to sepsis. The remaining 46 patients were reported "cured." The jaundice in every case rapidly disappeared, and the crises of hæmolysis associated with malaise, headache, and fever entirely ceased. The fragility of the red blood-cells, however, in some cases remained persistently high, although the erythrocyte count in all rapidly rose nearly to normal.

J. N. J. H.

OBSTETRICS AND GYNECOLOGY.

UNDER THE CHARGE OF

A. H. F. BARBOUR, M.D., AND J. W. BALLANTYNE, M.D.

SCOPOLAMINE MORPHINE IN LABOUR.

So much has been written and spoken of late regarding the scopolamine morphine method of relieving the pain of labour, that it has become necessary to restate the facts concerning the introduction of anæsthesia into obstetric practice. Glowing encomiums on the "twilight sleep" resulting from the hypodermic administration of scopolamine and morphine must not be allowed to obscure the fact that in January 1847 James Young Simpson for the first time delivered a parturient woman under the anæsthesia produced by ether, and so gave to the

world the priceless boon of painless labour. The case was an operative one, but it was not long before Simpson extended the benefit to ordinary confinements. Further, in the November of the same year (1847), he discovered the anæsthetic properties of chloroform, and replaced ether by it as more potent, more portable, and more pleasant. It is an old story how Simpson met with the greatest opposition, both within and from without the medical profession, and how by clinical evidence, by scientific facts, by now and again a little raillery and clever banter, and by tenacity and perseverance he broke down all obstacles and left suffering women securely in possession of the great gift of painless childbirth; but it is apparently requisite in these days to reaffirm his beneficent work and its humanitarian effects. If these facts are kept in view, it is possible to form a much more correct opinion of the value of the scopolamine morphine narcosis as applied to midwifery practice; if they had been kept in view the world of women would have been saved from much alarm consequent upon the publication of statements that, until the introduction of the "twilight sleep" in Austria and Germany, womankind was held firmly in the grasp of an irremediable torture whilst giving birth to children. Anæsthesia has been within their reach ever since 1847, and millions of women have gladly and safely received it at the hands of their intelligent medical attendants.

The claims which have been made for the substitution of scopolamine morphine narcosis for inhalation anæsthesia would seem to be as follows:—That it may be extended over the whole period of birth without danger; that it does not interfere with the contractions of the uterus and auxiliary muscles; that it is not followed by nausea; and that the patient whilst apparently conscious of all that goes on during the labour has no memory of the pains afterwards. It is also regarded as safe for both mother and child. These statements, however, require to be corrected in certain details. With regard to the matter of danger and inconvenience there is evidently some confusion in the minds of the writers; those who press scopolamine morphine upon the profession and the public have clearly failed to distinguish between the risks of chloroform anæsthesia in surgical practice and its almost complete immunity from danger in obstetrical cases. The safety of chloroform in midwifery practice, at any rate in the first and second stages of labour, is proverbial, and can be explained on scientific grounds to the point of demonstration: and it is also clearly proven by maternity hospital and private practice statistics and observation that it is unaccompanied by such unpleasant sequelæ as nausea and vomiting, and that "late chloroform poisoning," as it is called, is practically unknown. Again, the assertion that chloroform seriously interferes with the contractions of the uterus can be promptly met by the experience of obstetricians who have performed version with their patients under this anæsthetic. Whether it is an advantage for the

parturient woman to forget her suffering after it has happened in place of being unconscious of it at the time is a problem in psychology which may be difficult of satisfactory solution; but the fact that chloroform gives rapid freedom from suffering when it is at its height must not be lost sight of. It would seem, therefore, that the chief advantage which is claimed for scopolamine morphine over chloroform is, that the former can be used during the whole course of a confinement, and not solely in the second stage to which the latter is usually restricted. It will be well, however, to summarise some recent writings on the subject of the "twilight sleep."

In the Michael Reese Hospital in Chicago Dr. Joseph Louis Baer (*Journ. Amer. Med. Assoc.*, 1915, vol. lxiv. No. 21, pp. 1723-1728) tried the effect of the scopolamine morphine method in sixty cases of confinement, excluding all private cases, all cases threatening to become pathological, and all such as came in too soon before delivery to permit of the proper administration of the drugs. The patients were kept under constant observation, and the results were carefully registered and tabulated. The total dosages varied from $\frac{1}{8}$ to $\frac{1}{4}$ grain morphine, and from two doses of $\frac{1}{60}$ to nine doses of $\frac{1}{150}$ and eleven doses of $\frac{1}{60}$ grain scopolamine, hypodermically. Extreme precautions were taken—sound-proof wards, subdued light, smoked glasses, quietness in the room—to prevent any excitement in the patients during the action of the drugs. Dr. Baer, nevertheless, has had to report 26 cases in which there was "no success." The details of these are given, and one reads of one and another case that "the patient's mind was clear at all times"; that "she was delirious for several hours"; that "during the second stage she was absolutely unmanageable, could not be aroused, and had to have a restraining sheet"; that there "was vomiting"; that the "baby was born in asphyxia pallida and was resuscitated with difficulty"; that, in one instance, there was delirium, attempted suicide, and the patient had to be "shackled for four days"; and that, in another instance, the uterus ruptured and death followed notwithstanding that abdominal section was done. In seven cases Dr. Baer reports "little success," in eight "partial success," in five "fair success," in eight "good success," and in only six "complete success." Even in the cases labelled "fair" and "good" there are references to delirium and wild excitement, to incomplete amnesia, and to post-partum hæmorrhage. The summary which Dr. Baer gives of his experience can be checked by a reference to the fully set forth clinical details supplied in the article. It is as follows:—"The prolongation of labour, the increase in the number of foetal asphyxias, the excessive thirst and intense headaches that are so distressing, the difficult control of patients and avoidance of infection by soiling of the genitals, the more frequent post-partum hæmorrhages, the blurred vision, the ghastly deliriums persisting far into the puerperium, the

inability to recognise the onset of the second stage unless by risk of more frequent examinations, the masking of early symptoms, such as ante-partum hæmorrhage, rupture of the uterus, and even eclampsia, the violence and uncertainty of the whole treatment, the general bad impression given to our patients who are being taught to approach the 'horrors of labour' in fear and trembling, constitute so severe an arraignment of this treatment of labour cases that we feel compelled to condemn it, leaving open the merits of a single dose of morphin and scopolamin in those cases in which we have hitherto given morphin and atropin."

Dr. Walter E. Libby, an obstetrician in the University of California Medical School, whilst not going so far as Dr. Baer in his condemnation of the scopolamine morphine method in labour, surrounds the treatment with a large number of safeguards and cautions (*Journ. Amer. Med. Assoc.*, 1915, vol. lxiv. pp. 1728-1731). After referring to the varied results which had been obtained in Germany, to the untoward symptoms which Hocheisen had observed, to the impairment of uterine contractions noticed by Strassman, to the fatal case reported by Schneiderlein, and to the more favourable results reached when Siegel replaced the morphine by narcophine, Dr. Libby describes thirty-five instances (18 primiparous and 17 multiparous women) in which he employed scopolamine and narcophine (*morphine narcotine meconate*) in labour. The first dose was given hypodermically when the pains were from five to ten minutes apart and the os had a diameter of 2 cms. in primiparas and 4 cms. in multiparas; it amounted to 1.5 c.c. of scopolamine and 1 c.c. of narcophine. Subsequent smaller doses of scopolamine were given at intervals of an hour and a half, and narcophine was added to every third dose, according to Siegel's plan; but Dr. Libby found that if the schedule were implicitly followed uterine contractions occasionally ceased, or the infant was born deeply asphyxiated, and so he sometimes departed from it, and made it a rule that when the patient was deeply narcotised and the uterine contractions becoming impaired the next dose should be deferred or dropped. The average number of doses of scopolamine given was five to six, the largest number was thirteen and the smallest two. In all the 35 cases save five chloroform was employed towards the close of the second stage of labour; the five women in which it was not used were all multiparas, and although they remembered nothing of the delivery, Dr. Libby believed that aseptic measures could have been better carried out if chloroform had been administered. With regard to the general effect, it is stated that six cases (approximately 17 per cent.) not only experienced pain and remembered it, but also remembered other things which happened while in labour. The clinical phenomena during the narcosis are fully described in the article, and from their analysis it is admitted that there is prolongation of labour (to the extent of 3 or 4 hours in

primiparas and of one hour in multiparas), that the contractions of the uterus are impaired in the first stage of labour in one-fifth of the cases, that it is difficult to tell when the second stage has begun, that the patient has to be instructed to bring her voluntary muscles into play in the second stage, and that the forceps operation is more frequently required; but it is claimed that the third stage is usually uninfluenced, and that puerperal convalescence goes on undisturbed. It was found that six of the infants were born suffering from slight asphyxia and six from deep apnoea; the members of the latter group were all successfully resuscitated, but to do so vigorous measures were needed for a period of from fifteen to twenty minutes. Dr. Libby concludes that narcophine is open to the same objections as morphine, and that its use offers no advantage over that of morphine. Whilst he has met with no cases in which resuscitative measures failed, he has been impressed by the length of time required to start the infant breathing. He believes that once in six or seven cases the scopolamine narcophine treatment has not the effects for which it is given; but he is encouraged to continue its use, only he rejects all the cases in which complications of labour are anticipated, and he regards primary inertia, not infrequent in elderly primiparas, as a contra-indication. He adds that it must be recognised that the method has not reached the perfection which warrants indiscriminate use, and he recommends that the drug be used only where there is every indication that the patient will pass through a normal confinement.

Other articles on scopolamine and morphine amnesia ("twilight sleep") appear in the *American Journal of Obstetrics* for May 1915, pp. 721-741. These were communicated to the Obstetrical Society of Philadelphia in December 1914, and an interesting discussion followed in which Drs. Norris, Cooke Hirst, Longaker, Anspach, G. M. Boyd, and others took part. The first paper was by Dr. John O. Polak, who came to the conclusion that the method in the meantime was one for the expert in a maternity hospital, and that its greatest usefulness was as a first-stage procedure. The second was by Dr. Ralph M. Beach, who did not claim that "twilight sleep" would be a panacea for all women in labour, for the treatment was essentially a hospital one except among the wealthy, who could afford the assistants necessary. He believed that it was contra-indicated in primary uterine inertia, in marked pelvic contractions, in hæmorrhages (placenta prævia or accidental), in cases of a dying or dead baby, and in emergencies (eclampsia, prolapse of cord, transverse presentation, and conditions demanding operative interference). At the same time he thought it had certain advantages, viz a painless labour in about 85 per cent. of all cases, that subsequent nerve-exhaustion following a prolonged labour was avoided, that the milk secretion was better, that cervical lacerations were fewer, that forceps cases were diminished in number,

that cardiac cases went through the ordeal of labour more easily, and that there would be more babies and better babies because women of the better classes would have less fear of painful labour. In the discussion (*loc. cit.*, pp. 796-803) which ensued after Drs. Polak and Beach had read their papers, Dr. Barton Cooke Hirst was frankly sceptical; Dr. Anspach thought that in the majority of cases (certainly after the os was fully dilated) ether was a satisfactory form of anaesthesia, but that in a long-drawn-out first stage the scopolamine morphine method might find a useful field of employment; Dr. George M. Boyd thought that to eliminate suffering in the first stage of labour was the refinement of obstetrics; Dr. McGlenn emphasised the fact that the twilight sleep method was not applicable to every woman who had a labour pain; and Dr. Norris, after some carefully worded comments, came to the conclusion that the method might lead to an advance in midwifery by instituting a call for more maternity hospitals and a higher plane of obstetrics.

In conclusion, attention may well be drawn to a letter to the editor of the *American Journal of Obstetrics* (vol. lxiv. pp. 772-779) by Dr. R. W. Holmes, in which he, in strongly expressed statements, insists upon the risks and disadvantages of the scopolamine morphine method: "As the writer sees it the toll which must be paid is a prolongation of labour, increased frequency of forceps, the immediate danger from the slips in cleanliness—the development of sepsis—many babies seriously compromised if not lost as a result of the narcotics, and an occasional woman placed in jeopardy, if not killed, by her idiosyncrasy to hyoscine and morphine; it will not be long before the physician will begin to pay his toll by increasing numbers of damage suits as the result of the death of the baby, or the real or imagined injury to the mother."

Without taking so alarmist a view as Dr. Holmes, it may well be asked whether the present widespread interest in the "twilight sleep" represents more than a small permanent gain to obstetrics in the fuller relief of the sufferings of the first stage of labour by means of a drug (morphine) which has long been known to have a pain-relieving influence conjoined with certain well-known disadvantages. Indirectly the discussion which has been evoked may have beneficial results by reason of the light it has thrown on the pain undergone by women in the first stage of labour, and on the necessity to do something for its assuagement; but it is not clear that anything has been accomplished to warrant the extravagant statements in the medical and lay press which have been so freely made. To speak of painless childbirth as a gift of the first decade of the twentieth century is to be oblivious to what occurred in 1847; to claim an extension of the relief of suffering (then obtained) to the first stage of labour along with certain risks and inconveniences arising therefrom is much more nearly a fair

estimate of what has been or may be gained. It is not yet conclusively demonstrated that the combination of the scopolamine with the morphine or narcophine successfully abrogates the dangers of these drugs when given separately.

J. W. B.

THERAPEUTICS.

UNDER THE CHARGE OF

JOHN EASON, M.D., F.R.C.P.

THE OGILVIE METHOD OF TREATMENT OF SYPHILIS OF THE CENTRAL NERVOUS SYSTEM WITH STANDARDISED SERUM.

SWIFT and Ellis in 1912 introduced a method for the intraspinal treatment of syphilis of the central nervous system by salvarsanised serum. In previous numbers of this *Journal* their technique and the results accruing from this treatment in the hands of various observers have been epitomised. It appeared that the auto-sero-salvarsan treatment was a highly important addition to the therapeutics of cerebro-spinal syphilis. The great objections may, however, be urged against it that the technique is complicated and time-consuming and the strength of the serum in salvarsan was not controlled.

As formerly pointed out, some form of intraspinal technique is theoretically urgent, as it has been shown that salvarsan administered intravenously scarcely, if at all, reaches the ventricular fluid. If, however, the salvarsan be injected into the subarachnoid space it readily reaches the ventricles which communicate with the perivascular and perineural spaces. The Swift and Ellis technique consists in salvarsanising the patient intravenously and one hour afterwards removing some (50 to 60 c.c.) blood, from which serum is obtained, to be introduced intraspinally. Obviously this method does not permit of standardising.

Other methods of treatment devised consist of (1) introducing solutions of neo-salvarsan directly into the spinal canal. This produces marked irritative symptoms. (2) Neo-salvarsan in human serum subjected to a temperature of 56° C. for 30 minutes, then 37·5° C. for 45 minutes, and introduced intraspinally. Untoward symptoms were found to occur. (3) Method of Ogilvie (*Journ. Amer. Med. Assoc.*, 1914, vol. lxiii. pp. 1936-1941), by salvarsanising blood-serum *in vitro* of a known strength. The technique is as follows:—Approximately 60 c.c. of blood are withdrawn, and after allowing it to stand for a short time at room temperature it is centrifuged. A clear serum should be obtained absolutely free from haemoglobin and blood-cells. To 15 c.c. of this serum is added 0·25 mg. to 1 mg. of freshly prepared solution of salvarsan, made in the usual manner, taking 1 dg. of salvarsan to 40 c.c. of distilled water. Care has to be exercised that no excess of sodium hydroxide is added, the solution being rendered very faintly

alkaline. After mixing thoroughly, it is subjected to a temperature of 37° C. for 45 minutes and 56° C. for 30 minutes. This should be injected not later than three hours after its preparation. The lumbar puncture is done in the usual manner—15 c.c. of cerebro-spinal fluid is removed and 15 c.c. of the salvarsanised serum introduced gently by gravity, by connecting up a container such as the barrel of a Luer syringe. The patient should remain absolutely flat in bed for twenty-four hours.

W. C. Stoner (*Cleveland Med. Journ.*, 1915, vol. xiv. No. 6) has treated sixteen cases with a total of forty-two injections by this method. No untoward symptoms arose save pain, which generally required no treatment and passed off in twelve hours. After twenty-four hours patients generally suffer no, or very little, discomfort, and are able to work. In only two cases were the pains very severe, and these were cases of tabes, which were given a dose of 0.75 mg. The injections were given at fortnightly intervals. If the blood gave a positive Wassermann reaction an intravenous injection of 0.3 gm. salvarsan was given a week after the intraspinal treatment.

The cases treated were:—6 tabes, 1 paresis, 4 cerebro-spinal syphilis, 3 cerebral syphilis, 1 syphilitic hemiplegia, 1 syphilitic psychosis. The greatest number of treatments given a single case was six. The reaction does not increase with succeeding injections, and many cases experience no reaction whatever. The clinical improvement in certain cases has been striking. Cases of cerebro-spinal syphilis have lost their pains, deep reflex disturbances, and showed decided improvements in lumbar puncture findings. Early the counts are brought to normal, but the Wassermann and Lange globulin tests persist more or less to a degree of positiveness. The sensitiveness of the Lange globulin test and its behaviour toward syphilitic and non-syphilitic globulin make it an extremely interesting check on the study of the fluids subsequent to each intraspinal injection. A few times the fluid, two weeks subsequent to an intraspinal treatment, gave a non-syphilitic curve with the Lange globulin test, which is no doubt evidence of the presence of a blood globulin from the previous treatment. Early cases of paresis treated intensively show marked improvement mentally and physically and by laboratory tests. With regard to the results in tabes, the author says "it is striking to observe the loosening of the tight pupil, the lessening of the ataxia, the disappearance of the crises, and the general improvement of the mental and physical state." In the original paper by Ogilvie, he published reports of 15 cases which had been treated by salvarsanised serum of standard strength. In a recent paper (*Med. Record*, 26th June 1915, p. 1062) he furnishes a further report on the present status of these cases. The series consisted of seven cases of tabes, six of paresis (two of tabo-paresis), one of cerebro-spinal syphilis, and one of syphilitic myelitis. Those cases

that still showed serological evidences of the disease when the data for the first paper were collected have been treated consistently, while those that were negative at that time have simply been kept under observation and treated only when there were clinical or laboratory evidences suggestive of a renewed activity of the specific process. The technique was not changed. The strength of the serum employed and the frequency of administration have been determined by the character of the case under treatment, the physical condition of the patient, and the degree of resistance offered. Of the fifteen cases thirteen showed a complete disappearance of all subjective manifestations, with improvement in the objective signs in one way or another, for an average period of one year, while one showed moderate improvement only, and one failed utterly to respond to treatment. Of the total number, eleven cases (6 tabes, 3 paresis, 1 syphilitic myelitis, 1 cerebro-spinal syphilis) show spinal fluids negative to the Wassermann reaction in all titrations, with normal cell and globulin contents; two remain positive, and in two, recent analyses could not be secured. Ten cases (4 tabes, 4 paresis, 1 syphilitic myelitis, 1 cerebro-spinal syphilis) show negative Wassermann reactions in the blood, three remain positive, and in two, recent analyses could not be secured. As to the value of the treatment when systematically and judiciously employed, further comment seems unnecessary. While attributing great importance to the intravenous method, Ogilvie says less than 2 per cent. of his cases treated by the intravenous method alone or combined with mercury, even when given with heroic intensity, have shown evidence of a complete eradication of the laboratory evidences of syphilis in the spinal fluid. No matter how striking the clinical improvement may be the treatment has been inadequate unless this has been accomplished.

In neurological syphilis the field of greatest opportunity lies in instituting treatment in the predestructive stage. With this end in view the spinal fluid should be subjected to a rigid examination in every case presenting indefinite or transitory symptoms referable to the central nervous system, whether the patient gives a history of syphilis or not, and regardless of the existence of a negative Wassermann reaction in the blood.

ACONITE IN THE TREATMENT OF HIGH BLOOD PRESSURE.

As W. Hanna Thomson points out (*Amer. Journ. Med. Sci.*, vol. cxlix. No. 1, p. 77), one of the important questions in therapeutics is how to regulate arterial blood-pressure, particularly when it rises above normal. Morbid conditions due to high pressure are numerous. As chronicity is an outstanding feature, the evanescent action of all nitrites is little suited either for their prophylaxis or for their management. Thomson says that after an experience of years he regards aconite as the most efficacious vaso-dilator when given systematically in full doses. Aconite

when thus administered at once reduces blood-pressure, produces a full and compressible pulse, and greatly increases the percentage of the elimination of urea in interstitial nephritis. The preparation recommended is the tincture of the 1890 U. S. A. Pharmacopœia. This tincture contains 35 per cent., and Thomson has given as much as 10 drops of this strongest tincture 4 times a day with excellent results in the reduction of pressure.

The symptoms produced by heightened blood-pressure are usually distinct shortness of breath, often with a sense of oppression at the epigastrium, very perceptibly increased by muscular exertion, such as by walking or by ascending stairs, and especially by walking against the wind. Patients in such a condition are frequently obliged to stop, as they express it, "to catch their breath." Not uncommonly actual anginous pains come on with attacks of dizziness. In one case, a lady now seventy-five years of age, these symptoms were formerly very troublesome, but by perseveringly taking the aconite three or four times a day she has been free altogether from them for twelve years, provided she does not omit the aconite.

Another case was that of a well-known physician, aged sixty years, a somewhat fleshy man, with a large chest, and a blood-pressure of 185 mm., who had severe attacks of anginous pains, waking him about 2 A.M., which passed down the left arm to the wrist. He was treated with the present official U. S. A. 10 per cent. tincture, 15 drops combined with 5 grains sod. iodide t.i.d., whereupon all his symptoms improved, and his blood-pressure dropped from 185 to 160 mm. After continuing this line of treatment for two years he reduced the aconite to only 10 drops, with an entire disappearance of his old symptoms.

The beneficial effects of aconite are particularly pronounced in mental derangements of the nature of melancholia with high blood-pressure. In one case of maniacal melancholia Thomson was obliged to give 180 drops of the 10 per cent. tincture in the course of three hours. Thomson has apparently considerable experience of the use of aconite in doses which appear to the writer as being somewhat heroic. Although he has not had any untoward results one feels inclined to advise greater discretion in dosage until the method has been sufficiently tested in institutional cases.

OPHTHALMOLOGY.

UNDER THE CHARGE OF

W. G. SYM, F.R.C.S., AND ANGUS MacGILLIVRAY, M.D., D.Sc.

WAR INJURIES OF THE ORBITO-OCULAR REGION.

DE LAPERSONNE of Paris (*Archives of Ophthalmology*, January and February 1915) having treated some eighty serious wounds of the orbito-

ocular region, and finding that his results did not agree with former teachings, urges his colleagues carefully to note and collect all data concerning this class of wounds. The reason for this difference between past and present lies in the improvements in modern arms, the much greater velocity of bullets and artillery projectiles, and the modern methods of fighting.

The author recalls that wounds of the eye and orbit may be produced (1) by cylindro-conical bullets that taper sharply and have a high projection force; (2) by spherical lead balls coming from shrapnel, whose projection is much less; (3) by the bursting of shells close by; and (4) by a large number of foreign bodies—powder, fragments of iron or copper, earth, pieces of glass and clothing, etc.—driven into the tissue by the explosion of shells, shrapnel, or grenades.

The projectiles traverse the orbit either antero-posteriorly or transversely. In the former case they generally enter the cranial cavity, after bursting the eye, and produce encephalic lesions, which, however, are not always fatal. If the projectiles are nearly spent, or if they have ricocheted, they may come to rest in the orbit or its surroundings, whence they may be easily extracted. Such was the case in a clerk who received a Lebel bullet which had been intended for a Taube. The ball had lodged in the outer part of the orbit. A sclero-corneal suture was placed and the eye saved; the sight, however, was lost through a complete detachment of the retina.

Localisation enables us to determine the seat of the projectile and to extract it without causing much destruction of tissue. In this way a German bullet which, after glancing off the external orbital margin, had turned round and buried itself under the malar bone, remaining entire, was outlined and easily extracted by the butt.

The transverse wounds of the orbit are in a class by themselves on account of the serious consequences. In the war of 1870-71 the Germans collected twenty-eight cases of this kind, in nine of which both eyes were immediately destroyed. We are already familiar with pistol-shot wounds of this kind from criminal attacks and suicidal attempts. In the eighty cases collected during this war, fifteen were transverse wounds of the orbit, and in seven immediate bilateral blindness resulted. The results of these transverse wounds vary according to the obliquity of the path pursued by the projectile and to the depth at which the projectiles traverse the orbit. In one case there will be bursting of both globes; in another bursting of one globe and rupture of the choroid, intra-vitreous hæmorrhage, and detachment of the retina in the other eye. If the bullet passes near the apex of the orbital pyramid, we have a large retro-ocular hæmorrhage, with motor and sensory paralyses, tearing or bruising of the optic nerve, etc.

Wounds from the bursting of shells are not so dangerous, as far as the conservation of the eyes is concerned, as wounds from

bullets. In recent wars only 25 to 35 per cent. of the eyes wounded by bullets could be saved, whereas 60 to 70 per cent. of the eyes injured by shells were conserved. De Lapersonne was not as fortunate with his fifty-nine cases, and even when he did save the globe the sight was much impaired. Just as deaths are reported from the bursting of shells which did not touch the person, so we have grave commotion of the eye from shells bursting near by. Detachment of the retina and retinal hæmorrhages have been reported; temporary amblyopia, with photophobia, tearing and blepharospasm are often seen, and resemble the cases of ocular hystero-traumatism which are not uncommon in industrial accidents. These conditions are short-lived: a few days of rest and tests of vision to expose malingerers will put an end to them in a few days. There is this to be considered, that under the influence of this commotion even the slightest traumata—foreign bodies in the conjunctiva or cornea—have often more serious consequences, even though rigorous antisepsis be observed. In this regard we have a parallel to the injuries due to mine explosions. In another place the author has related severe cases of irido-cyclitis brought on by very superficial injuries to the eyes of miners caught in explosions of fire-damp.

Penetrating wounds of the orbit often give rise to traumatic cataract, and in these cases surgical intervention is to be strictly avoided, as it would bring on a severe plastic irido-cyclitis. If the radiogram shows the presence of foreign bodies in the eye an immediate enucleation should be resorted to. If the foreign body is magnetic and the wound fresh, one might try to extract it with the magnet; but the chances of obtaining a good result are far less than in the industrial accidents, as the wound is so often infected.

The most frequent accident is the rupture of the globe. In some cases there is a large star-shaped opening in the cornea, sometimes a large rupture of the sclera, either in the anterior or posterior hemisphere. The detachment of the membranes is total and the globe filled with a blood-clot. Enucleation in these cases was done thirty times in the eighty cases and in reality amounted to a trimming up of the stump. Lesions of the bony orbit and of the upper maxilla, with vast destruction of the soft parts, accompany these wounds and demand treatment at the same time. The orbital margins are often veritably pulverised and the particles sometimes driven even into the globe. Fractures at the base of the skull, injuries to the accessory sinuses of the nose, large defects in the upper maxilla, so that orbit, maxillary sinus, and buccal cavity are all thrown into one cavity, occur. In one case the radiogram showed a large cubical piece of a shell which, ranging downwards through the frontal sinus, had passed behind the globe, causing a detachment of the retina and a division of the optic nerve, and lodged between the orbit and the maxillary sinus. In another case a

shrapnel ball had passed through the orbit, rupturing the globe, and had lodged near the sphenoidal sinus on a level with the basilar apophysis, hardly raising the pharyngeal mucosa. As both these bodies are well tolerated no attempt has been made so far to remove them. In spite of the gravity of some of these wounds, when the patients recover from the shock the general health becomes excellent and no deaths have so far occurred.

As to the treatment of these cases, the first thing to consider is the general condition. More than any other, the soldier who has been wounded in the ocular region reaches the hospital in a depressed, discouraged, somnolent state, and the first thing to do after cleansing the wound is to let him sleep. Antitetanus serum should be used in all cases, even in those where the wound seems insignificant, and after a careful cleansing of the wound, and the removal of all foreign bodies, the parts washed with hydrogen peroxide, one part in four of water. As the conjunctival sac does not tolerate hydrogen peroxide, a saline solution containing fourteen grammes of salt to one thousand of water should be used. Compresses wet with permanganate of potassium, one-half in one thousand, are useful in the first days, but should be discarded as soon as the sloughs come away. Here, as in all war surgery, tincture of iodine gives excellent results, and should be applied every two or three days to the gray spots. Iodoform can be applied in powder, or in a 10 per cent. ointment, to the conjunctiva.

Early reunion should be prevented, although large flaps should be approximated. Especially in the wounds of the eyelids complicated with large hæmatomata, sutures should not be placed, as this leads often to abscess of the lid. Even in wounds of the lid-margins it is better to wait a few days and then to freshen the edges. Corneal and scleral sutures find but little employment in these war injuries, in view of the severity of the injury, the infection, and the intra-ocular hæmorrhage. Sewing the conjunctiva over corneal wounds is, as in ordinary eye surgery, of great value. Traumatic cataracts should be handled very gingerly unless a condition of secondary glaucoma supervenes, in which case the removal of the lens by suction will offer the least offensive means.

Although sympathetic ophthalmia is not as frequent in its severe form as it formerly was, there exist a number of "attenuated sympathetic ophthalmia" cases which are not as alarming in their incipieny but just as serious as to vision in their final results. But even in its severe form, sympathetic ophthalmia is not precocious, and has never been noted before the seventh or eighth day, so that immediate enucleation in ambulances, etc., is not called for, and should not be practised until the patient is suitably housed in a special hospital. It should be borne in mind that these enucleations are more difficult than those ordinarily performed, on account of the complica-

tions presented by the wounds of the surrounding tissues. The conjunctiva should never be sutured, and a drain should be left in for forty-eight hours to prevent the accumulation of blood in the orbital cavity. If the radiogram shows that there is no foreign body in the orbit, the healing is simple. The fitting of a prosthesis presents more than the ordinary difficulties, on account of the large amount of cicatricial contraction generally present.

A. MAC'G.

NEW BOOKS.

Diet and Disease in Infancy. By HECTOR CHARLES CAMERON, M.D., F.R.C.P. London: J. & A. Churchill. 1915. Price 8s. 6d. net.

DR. CAMERON'S book deals not merely with the feeding of infants, but with a number of the nutritional disorders common in infancy and early childhood. This plan has already been adopted by several authors, particularly in Germany, and Dr. Cameron is, in the main, a follower of the doctrines of Finkelstein and Czerny. In his preface he confesses the great difficulty of his task, and those who are best acquainted with modern work on the metabolic disturbances of infancy will be the first to sympathise with him, for there is scarcely a problem in medicine as to which our knowledge is in a more fluid condition, or one in which modern teaching has more completely broken with the theories of the past, than the feeding of infants. While the reviewer is far from satisfied that present-day theories and hypotheses are final, he has to congratulate Dr. Cameron on the way in which he has sifted the wheat from the chaff, and presented the main outlines of a complicated subject in a concise and judicial way. Without attempting anything in the way of criticism, it seems right to instance here some of the chief departures from the older views, still generally current, which characterise the modern school of thought.

While clean milk is a *sine qua non* for infants, success in feeding cannot be attained by sterilising alone, nor can bacterial contamination be fairly charged with blame for many diseases. Summer diarrhoea, for instance, is rarely due to infection; it is probably caused partly by direct thermal influences and partly by abnormal carbohydrate fermentation in the bowel favoured by the heat. As regards the indigestibility of cow's milk, casein is almost certainly its least hurtful constituent; probably the whey salts are the ultimate peccant cause, and through their action on the intestinal cells pervert the assimilation and metabolism of fats and sugars. When fat digestion is faulty the marasmic group of diseases occurs; when the sugar digestion is at fault we get dyspepsia and diarrhoea. In all these diseases individual tolerance plays a preponderating rôle; we are returning from a purely cellular conception of disease to the days of constitutions and diatheses.

Overfeeding, with fat or starch, is a great cause of difficulty, and no single food can be regarded as ideal. Hence the indiscriminate denunciation of proprietary and other composite foods has ceased, for it is realised that each ailing infant is a problem by itself, and there is no longer an appeal to any hypothetical "Nature's standard" in constructing a dietary. If the child has been overfed with milk, it may thrive on a sugar-rich, fat-poor mixture (hence the great success of many patent foods) which a decade ago would have been condemned off-hand as irrational. These are a few of the leading doctrines of the modern school, and as we believe that, on the whole, they are an advance in the right direction, we hope that Dr. Cameron's exposition of the subject will have a wide circulation.

Although Dr. Cameron follows the German-American school, his book is by no means a compilation. He avoids the extravagant claims made by enthusiasts for special foods, and, guided by general principles, gives simple rules for meeting difficulties. Undoubtedly it is possible in most cases by intelligently using skimmed milk to escape the necessity for employing *Eiweiss-milch*, which is rather difficult to prepare, and scarcely repays the trouble entailed. Again, though he does not overestimate the importance of sterilisation in nutritive disorders, he is careful to point out the risks of tuberculosis from the use of raw milk. Altogether, this is a most satisfactory presentation of modern methods by one conversant with the conditions (and, it may be added, the constitutions) prevalent in England; it has been a pleasure to read it, and for the sake of child-welfare we hope it will find a large circle of readers.

Infant Mortality. By HUGH T. ASHBY. Cambridge University Press. 1915. Price 10s. 6d.

THIS is an excellent little book, and the author is to be congratulated on its production. It appears at an opportune moment and deserves to be widely read.

The subject is no easy one to deal with in a readable and interesting fashion, but the author is happy in his manner of exposition.

Within the last few years the subject has become additionally complicated by the development of a large number of different societies, each dealing with some phase of the work. In the present volume the whole problem of infant mortality is clearly portrayed, and an excellent survey given of the methods presently in force to counteract it.

The field is one which offers almost unlimited scope for philanthropic effort, and at present the bulk of the work is done by voluntary agencies. It seems clear, however, that co-ordination of work is becoming more and more essential, and that the problem must be tackled on a larger and more complete scale.

This volume is the first of a series to be published on various subjects connected with public health, and if the following volumes maintain the high level of excellence of the one under review the series will prove a valuable one.

War Surgery. By EDMOND DELORME. Translated by H. DE MÉRIC.
Pp. 248. With Illustrations. London: H. K. Lewis. 1915.
Price 5s. net.

THE name of the Inspector-General of the French Army is sufficient guarantee of the authoritative character of this short work. It is designed "to avoid the excess of operative measures which has been seen in recent wars," and "to lay stress on the almost uniform conservatism of our present surgery." The early months of the present war abundantly proved the necessity for such ideas being inculcated, and even yet a word of warning may not come amiss. The introductory chapter deals with the missiles used by modern armies and discusses such ballistic data as are essential to a proper understanding of the injuries they inflict. In succeeding chapters the lesions of individual tissues, organs, and regions are succinctly dealt with in a thoroughly practical manner. The limits of space which the author has set himself necessitate a dogmatic statement of his opinions, but these are so obviously the outcome of extensive practical experience that they at once carry conviction, and the reader feels no desire for a more detailed argument. We cannot imagine a more serviceable guide to the military surgeon, and we confidently commend it to the attention of all who are called upon to treat the wounded either on the field or in base hospitals.

Sanitation in War. By Major P. S. LELEAN, F.R.C.S. With an Introduction by Surgeon-General Sir ALFRED KEOGH, M.D.
Pp. x. + 267. London: J. & A. Churchill. 1915. Price 5s. net.

THIS pocket-book consists of a series of lectures delivered at the Royal Army Medical College since the outbreak of the war. The subjects dealt with are all of supreme practical interest, for in matters military, even more than in civil life, prevention stands far in front of cure in importance. The nine lectures are devoted to physical fitness for war, anti-typhoid inoculation, medical organisation in the field, the march, sickness in the army, the rôle of insects in war, field conservancy, and water supplies, and the book is so compact as to fit easily into the pocket. At present, when so many doctors, old—or at least middle-aged—as well as young, are donning the King's uniform, there is great need for a book of this kind, for it must be realised that military medicine is a special subject, demanding special study. Major Lelean's lectures deserve a wide circulation among those now for the first time undertaking military duties, and the information they give, if attended

to, should obviate many difficulties and prevent many mistakes. They are concise and interesting, and the work of a man who knows what he is talking about.

A Nursing Manual for Nurses and Nursing Orderlies. By DUNCAN C. L. FITZWILLIAMS, M.D., Ch.M., F.R.C.S. Pp. 466. With 106 Illustrations. London: Henry Frowde and Hodder & Stoughton. 1915. Price 6s. net.

THIS book is primarily intended for the use of nurses, and the author has succeeded in his endeavour to include the main essentials which a nurse, a nursing orderly, or a Red Cross worker should know. The subject-matter is so arranged that the common diseases are associated with the anatomical and physiological description of the organs concerned, and this helps the association of ideas. The various subjects are clearly and concisely dealt with, and the author has refrained from being too technical. The illustrations are numerous and well chosen, and assist greatly in the explanation of the text. As may be expected in a first edition there are a few errors to be noted, and one of these may be instanced where on p. 19 the number of cervical vertebræ is given as 5 instead of 7. First aid in the field has been fully dealt with, and at the present time this will prove of great value. The index is clearly arranged and is full and complete. This book should prove of great value to those for whom it is intended, not only during the present time of war but also in less strenuous times.

NEW EDITIONS.

The Operative Treatment of Fractures. By Sir W. ARBUTHNOT LANE, Bart., M.S., F.R.C.S. Second Edition. Pp. 184. 226 Figs. London: Medical Publishing Co., Ltd. 1914. Price 10s.

SURGEONS will value this book for the account which it gives of Sir Arbuthnot Lane's methods of operating on simple fractures, a subject on which he is an acknowledged master. They will be disappointed, however, if they are on the lookout for guidance as to when they are to operate and when to hold their hand. The author would apparently recommend a skilful surgeon to operate in almost every case of simple fracture if his aseptic technique were reliable. The opinions strongly and confidently expressed throughout this book are not generally supported by convincing arguments. One of the chief reasons given for advocating operation in simple fractures is the supposed invariably bad result of non-operative treatment.

When the first edition was published sixteen or seventeen years ago, reference was made to what were then recent methods of non-operative treatment. Attention has since that time been frequently drawn in medical journals to improvements in non-operative treatment, but Sir Arbuthnot Lane does not appear to have considered them.

The original references remain as they were. Thus on page 34 of the present edition Sir Arbuthnot Lane says: "Instead of quoting the fossilised reproductions in surgical text-books I prefer to furnish extracts from recent teachings in England"; and goes on to quote from the *Clinical Journal* of 15th May 1895, and from the *Lancet* of 4th January 1896 and 12th June 1897. It may be true that some surgeons still practise the non-operative methods of eighteen and twenty years ago, but their results are not the best attainable at the present time by the non-operative methods. Just as it would be unfair to the operative method to judge of it from the results obtained by any but well-instructed and skilful operators, so it is unfair to estimate the value of the non-operative method by a similar standard.

In the Report by the Fractures Committee of the British Medical Association no attempt was made to distinguish in the statistical tables between the work of individuals using either operative or non-operative methods. This way of dealing with the results was probably unavoidable under the circumstances, but it nevertheless detracted from the value of the opinions expressed by the Committee. One of the main conclusions in the Report, however, is quoted by Sir Arbuthnot Lane. It is as follows:—

"The statistics relative to the non-operative treatment of fractures of the shafts of the long bones in children (under the age of fifteen years), with the exception of fractures of both bones of the forearm, show, as a rule, a high percentage of good results. These are unlikely to be improved upon materially by any other method of treatment."

In spite of this, however, and although Sir Arbuthnot Lane says: "Like the Committee, I have not the slightest doubt as to the best method of dealing with simple fractures," he has not altered his views as to the treatment by operation of fracture of the femur in children. On page 83, in dealing with fractures of the femur in children, he says: "I do not hesitate to operate to ensure a perfect result even when the displacement is inconsiderable."

But the advocacy of operative methods found in this book is based not only on the supposed inferiority of all possible non-operative methods, but also upon a theory which Sir Arbuthnot Lane treats as if it were beyond discussion. He repeatedly states that no perfectly satisfactory functional result after a fracture can be obtained unless there is a perfectly satisfactory anatomical result. That is a statement which *a priori* sounds well, but is not borne out by surgical experience in other parts of the body as well as with regard to bones. Curiously enough Sir Arbuthnot Lane has been blamed for advocating, too strenuously, interference with the anatomical structure of the alimentary canal in order to restore the healthy functions of the body in ailments too numerous to mention. If all he says about the value of the colectomy be accepted, good functional results after an operation on the

alimentary canal at least are not dependent on good anatomical results.

In many other parts of the body, however, functional results do not seem to be impaired by altered anatomical results, as, for instance, by the removal of a semilunar cartilage or a kidney, and this is certainly true of certain fractures, as, for instance, a fractured clavicle. It is the experience of every general practitioner that a fractured clavicle scarcely ever leaves an unsatisfactory functional result, but just as seldom leaves a satisfactory anatomical one.

The whole question turns upon the power of compensation possessed by the body. Where compensation is possible, anatomical results may be greatly altered without appreciable loss of function; where compensation is deficient, restoration of anatomical perfection is correspondingly important.

This is the problem which surgeons have still to work out with regard to fractures. They have to learn how to attain, without operation, the maximum of functional return after a fracture in a minimum of time, and to understand in what cases operation will give a better result, and at what risk.

When they have made up their mind that an operation is necessary they will be grateful to Sir Arbuthnot Lane for his great work in developing the operative side of the question, but they are not likely to follow him in his sweeping condemnation of all non-operative measures.

Swanzy's Handbook of the Diseases of the Eye. Edited by LOUIS WERNER. Eleventh Edition. Pp. xviii. + 646. With 270 Illustrations. London: H. K. Lewis. 1915. Price 12s. 6d. net. THE eleventh edition of this work, which is brought out by Dr. Werner alone owing to the death of Sir Henry Swanzy, will be received with great pleasure by all who are interested in ophthalmology.

Many improvements and additions, both in illustrations and in the text, have been made without increasing the size of the book. Due justice is done to Edridge Green's theory of colour vision, while Holmgren's wools have been eliminated. The chapter on retinal diseases has been largely recast, and serviceable articles have been added in connection with artificial eyes, heterophoria, nystagmus, the Schiötz tonometer, and other subjects. The chapter on the pupil has been replaced, but unfortunately without the tables giving the comparative actions of the chief mydriatics and myotics, which formed—especially to beginners—a very useful feature of the ninth edition. The new illustrations are excellent, though one, that showing the "nasal step" in the field of vision in glaucoma, might have been more happily chosen.

Apart from such small matters the present edition will be found further to increase the well-deserved popularity of Swanzy's *Handbook*, which we heartily recommend to practitioners as well as students.

Materia Medica, Pharmacy, Pharmacology, and Therapeutics. By W. HALE WHITE. Fourteenth Edition. Pp. xii. + 712. London: J. & A. Churchill. 1915. Price 6s. 6d. net.

THIS edition, like its predecessors, is a model of accurate information put in as interesting and concise a form as the nature of the subject permits. Necessarily a good many alterations have been made as a result of the appearance of the new Pharmacopœia. The volume is the work of an authority who has succeeded in arranging the information he seeks to impart in a manner easily comprehensible by the student, for whom the volume can be recommended.

Materia Medica and Therapeutics. By J. MITCHELL BRUCE, M.D., and WALTER J. DILLING, M.B. Tenth Edition. Pp. xiv. + 645. London: Cassell & Co., Ltd. 1915. Price 6s. 6d. net.

THE issue of a new British Pharmacopœia has necessitated the production of a revised edition of this well-known students' text-book of *Materia Medica*. It was first issued in 1884, and is now in its fifty-eighth thousand, a record which can have few parallels in medical literature. The new "Mitchell Bruce," with its familiar red cover, will, we are sure, be as popular as ever. The revision has been carefully and thoroughly performed.

A Treatise on Materia Medica and Therapeutics. By RAKHALDAS GHOSH, L.M.S., Calcutta. Edited by B. H. DEARE, I.M.S., with the assistance of BIRENDRA NATH GHOSH, F.R.F.P.S., Glasgow. Sixth Edition. Pp. xii. + 698. Calcutta: Hillon & Co. 1915. Price Rs. 5, or 7s. 6d. net.

THIS text-book of *Materia Medica*, for Indian students, has been thoroughly revised and brought into accord with the new British Pharmacopœia. The classification of the drugs is now according to their pharmacology, instead of, as formerly, alphabetical, and unimportant non-official remedies have been deleted. The volume is a thoroughly trustworthy handbook of materia medica, and contains an excellent account of the more generally approved vaccines and serums, for the revision of which Major E. D. W. Greig, I.M.S., is responsible. We can cordially recommend the work.

The Extra-Pharmacopœia. By W. H. MARTINDALE, Ph.D., F.C.S.; and W. WYNN WESTCOTT, M.D., D.P.H. Sixteenth Edition. Vol. I., pp. xl. + 1113; Vol. II., pp. viii. + 469. London: H. K. Lewis. 1915. Vol. I., 14s. net; Vol. II., 7s. net.

AS was to be anticipated, the issue of a new British Pharmacopœia has involved the production of a new edition of the Extra-Pharma-

copœia. The revision has been very thorough, and extends far beyond the limits demanded by the 1914 British Pharmacopœia. The plan of dividing the book into two volumes, first adopted in the 1914 British Pharmacopœia, has been adhered to, and the use of a slightly larger type is a distinct improvement. The trail of war has left its mark on this, like other activities, for the authors have in many instances given the British Patent numbers of proprietary substances originating in Germany, in order to facilitate reference by those contemplating their home manufacture. We never look at a new edition of the Extra-Pharmacopœia without wonder at the multifarious nature of its contents and at the industry of its authors. It is indispensable for reference and unique as a source of information.

A Manual of Chemistry. By ARTHUR P. LUFF, M.D., F.R.C.P.; and HUGH C. H. CANDY, B.A. Fifth Edition. Pp. xix. + 660. London: Cassell & Co., Ltd. 1915. Price 8s. 6d. net.

THE new edition of this excellent students' manual of chemistry in the main resembles its predecessors, but has been thoroughly revised. The sections on ionisation and electrolysis have been expanded, and the chapter on volumetric analysis has been extended to include the volumetric aqueous solutions of the B. P. (1914). The fact that one of the authors is a physician ensures that the requirements of the medical student are adequately kept in view, and the result is a compact, excellent text-book.

A Text-Book of Medical Jurisprudence and Toxicology. By Professor JOHN GLAISTER, M.D., D.P.H., F.R.S.E., etc. Third Edition. Pp. xv. + 822. With 138 Illustrations. Edinburgh: E. & S. Livingstone. 1915. Price 15s. net.

WE do not wonder that a third edition of Professor Glaister's well-known work has been called for. In the majority of text-books on this subject the legal aspect receives inadequate treatment at the hands of the medical author, and often when we consult such books of reference we find that they afford little guidance. It is far otherwise with the volume under review, for, if possible, it must appeal even more to the lawyer than to the medical practitioner on account of the very full treatment of the legal aspect of the various subjects. While the author has rearranged some chapters and abbreviated others, he has not found it possible to keep the work within its former limits, and has had to increase it by some 58 pages. An interesting account of the General Medical Council, its statutory powers and penal resolutions, has been incorporated.

A Handbook of Medical Jurisprudence and Toxicology. By WILLIAM A. BREND, M.A.(Camb.), M.B., B.Sc.(Lond). Second Edition. London: Charles Griffin & Co., Ltd. Price 8s. 6d.

THIS neat and compact volume only aspires to aid students in passing their examinations. In addition a chapter on the law relating to medical practice has been embodied. The matter contained in this book is excellent. In order to conserve space, illustrative cases have been omitted, but everyone will not agree that that is a good feature. We have gone carefully over the various chapters and can safely say that the teaching is sound and reliable, and can therefore be studied with every confidence that the knowledge acquired will serve the purpose of the author. As has already been indicated, the publishers have done their work with their accustomed care.

A Manual for Midwives. By C. NEPEAN LONGRIDGE, M.D., F.R.C.S. (Eng.); and JOHN BRIGHT BANISTER, M.D., F.R.C.S.(Edin.). Second Edition. Pp. 339. With 51 Illustrations. London: J. & A. Churchill. 1915. Price 3s. 6d.

A SECOND edition of this manual for midwives has just been issued, and it has been rearranged and partly rewritten. It has been expressly written for the use of midwives, and Chapter I. forms a short but clear and descriptive account of the pelvic organs, and contains no more anatomy than the midwife really requires.

The type throughout is exceedingly good, the headings being in a bold type, which helps to make the text easily followed. Though a book on midwifery, we are glad the authors have included a chapter on cancer of the uterus, recognising the enormous importance of every midwife doing something to check the waste of life which results from ignorance of the early symptoms of this disease. A chapter is devoted to the rules of the Central Midwives Board, but what is even better is the fact that some of these are discussed throughout the book, under the subjects to which they belong. As a book for the instruction of midwives we think it one of the best which has yet appeared.

Medical Electricity, Röntgen Rays, and Radium. By SINCLAIR TOUSEY. Second Edition. Pp. 1219. With 798 Illustrations. Philadelphia: W. B. Saunders Co. 1915. Price 35s. net.

TOUSEY'S first edition is a well-known standard work on medical electricity. It was published in 1910, and since then there has been voluminous literature, and many fresh discoveries in this branch of medical science. The second edition, just published, brings the work up to date, and although it contains only a hundred additional pages,

it leaves out nothing of importance in the advance which has been made during the intervening five years. The chapter on the application of condenser discharge for electro-diagnosis has been re-written with advantage. Diathermy is well explained, with changes which occur in the tissues during its application, and the several uses to which this modality may be put in connection with electrical treatment.

Little advance seems to have been made in the X-ray diagnosis of pulmonary phthisis, and the same *dicta* as laid down five years ago are simply re-stated. There is a new chapter added on "Precautions against X-ray Injuries," accompanied by a beautifully coloured print of the author's own hand, showing X-ray dermatitis in process of cure by means of radium. Sinusoidal currents, intensifying screens, and new X-ray tubes are noted. The addition of tabular classification of electric methods, effects, and uses is an improvement.

It is a complete work from the purely scientific standpoint, and a valuable addition to our literature on the subject of medical electricity and Röntgen rays.

Treatment of Tuberculosis and Lupus with Oleum Allii. By W. C. MINCHIN, M.D. Second Edition. Pp. xii. + 114. With 8 Plates. London: Baillière, Tindall & Cox. 1915. Price 5s. net.

THIS little volume has increased considerably in size since it was first issued. Its author's belief in the efficacy of oleum allii has, if possible, increased in a similar degree. We should rejoice if all his claims for this remedy, even in advanced cases of tuberculosis, had been substantiated by our own experience in a series of cases.

An Index of Symptoms, with Diagnostic Methods. By RALPH WINNINGTON LEFTWICH, M.D. Fifth Edition. Pp. 516. 14 Illustrations. London: Smith, Elder & Co.

IN this work the plan is taken of making symptoms form the headings instead of the usual plan of grouping symptoms under the headings of diseases. It is intended as a book of reference, and will probably be of most use for suggesting clinical possibilities in diagnosis. In going over it one is impressed with the remarkable thoroughness and care with which the author has done his work. The amount of labour entailed in its production must have been very great.

NOTES ON BOOKS.

THE editor of *The Medical Annual* (John Wright & Sons, Ltd., price 10s. net) is to be congratulated on the fact that his entire staff of contributors, despite the many other claims on their time and energies incident to the war, have been able to share in the production of the 1915 series. This ensures a continuity of outlook and the maintenance of that high standard of usefulness which has for so long characterised this publication. In a work which deals largely with treatment it is appropriate that particular attention should be directed to the new Pharmacopœia in the special articles contributed by Professor Charteris and Mr. Gadd. Among the many critical abstracts of recent work may be cited those by Mr. Thurston Holland on radio-activity and electro-therapeutics, and Dr. Robert Hutchison's judicial estimate of the clinical importance of intestinal stasis and intestinal intoxication. The surgery of war is incidentally referred to in many of the surgical paragraphs and in special articles contributed by Deputy Surgeon-General A. Gascoigne Wilney, R.N., Colonel Louis a la Garde, U.S. Army (retired), and Mr. G. Lenthal Cheatle.

Simple Methods of Radiographic Localisation. The localisation of foreign bodies in the tissues by the aid of the X-rays has acquired enormous practical importance, and innumerable methods have been devised to render this at once accurate and simple. We have before us a short monograph on the subject by Mr. Thomas Rankine, Radiographer to the Edinburgh War Hospital, Bangour (W. Green & Son, Ltd., price 1s.). After the photographic plate has been produced in the manner described in the text, the position of the foreign body is determined in a few seconds by the aid of a table of graphs provided, and a pair of compasses. From personal experience of the method we can testify to its reliability.

The publication of the new Pharmacopœia has necessitated revision of the current works on materia medica and dispensing, and new editions of these are appearing in rapid succession. We have received the fifth edition of *Thompson's Compendium* (John Bale, Sons & Danielsson, Ltd., price 5s. net). It contains a long list of modern remedies, official and non-official; synopses of the various European pharmacopœias, as well as of those of America and Japan; a selection of useful formulæ, and much other valuable information.

A third edition of *Bennett's Materia Medica and Pharmacy* (H. K. Lewis, price 4s. 6d. net) has also appeared. It furnishes the student of medicine with a compact summary of materia medica, and contains a useful appendix on incompatibility.

TRANSACTIONS, REPORTS, ETC.—The thirteenth volume of *Reports from the Laboratory of the Royal College of Physicians, Edinburgh*, edited

by Dr. J. J. Graham Brown and Dr. James Ritchie, contains the record of work published by workers during the years 1913-1914, and bears eloquent testimony to the activity in this centre of scientific research in Edinburgh. Even where all the papers are of high scientific and practical value it is not invidious to select for special reference the masterly studies of the late Dr. Alexander Bruce and Dr. James W. Dawson on "Multiple Neuromata of the Central Nervous System," and Dr. J. P. McGowan's "Investigation into the Disease of the Sheep called 'Scrapie.'"

The Transactions of the American Surgical Association for 1914 (vol. xxxii.), edited by Dr. Archibald MacLaren, contains a number of valuable contributions ranging over the whole of surgery. A considerable number of the papers deal with the subject of malignant disease, with special reference to prophylaxis and treatment. Abdominal surgery is largely represented, as is also the surgery of the respiratory organs. This publication furnishes an admirable index of the higher developments of surgery in the United States.

We have received the nineteenth volume (second series) of the *Index-Catalogue of the Library of the Surgeon-General's Office, United States Army*. As it includes V to Vzielli it must be nearing completion. Such a work does not lend itself to detailed notice, but as a source of reference it is invaluable.

The *Tenth and Eleventh Reports of the Henry Phipps Institute for the Study, Treatment, and Prevention of Tuberculosis* (Philadelphia, 1915) deal with pulmonary acoustic phenomena and housing and social conditions in Philadelphia. Both are careful studies, the former of the physical basis of the phenomena determined by auscultation of the lungs, and the latter of the social relations of tuberculosis.

From Messrs. Robert Gilson & Sons (Glasgow), Ltd., we have received the *Medical Practitioners' Day-Book*. It is arranged for insured patients, and appears well adapted for its purpose. The price (1s.) is moderate.

EDINBURGH MEDICAL JOURNAL.

EDITORIAL NOTES.

Annus Academicus
1915-1916.

IN our Educational Supplement will be found particulars of the medical curriculum in the Scottish Universities and other teaching institutions. It will be observed that while many members of the teaching staffs in all the schools are engaged on military and other duties incident to the war, arrangements have been made to ensure that the training of the rising generation of medical men shall in no way be less thorough and efficient than it has been in the past.

In Edinburgh the classes open on Tuesday, 5th October, and they continue till Friday, 17th December, when the Christmas vacation begins. On Tuesday, 4th January 1916, the classes re-open, and the winter session ends on Wednesday, 15th March. The summer session begins on Tuesday, 18th April, and ends on Friday, 30th June.

German War-Cripples.

WHAT is being done to cope with the problem of the ever-increasing multitude of crippled soldiers? From Mr. D. C. M'Murtrie, editor of the *American Journal of Cure for Cripples*, there comes a careful study * of the German answer to this question. During the early days of the conflict the burden of the undertaking was assumed by an already important organisation, the Deutsche Vereinigung für Krüppelfürsorge, under the patronage of the Empress and the leadership of Dr. Konrad Biesalski; and before many months had elapsed the number of cases being dealt with amounted to more than forty thousand. The task to which the Association applied itself was twofold—medical and social. After all that orthopaedic measures can do to remedy anatomical defects had been done, there remained the economic duty of reinstating the cripple as a useful and self-supporting member of the community. Cripple colonies, consisting of forty or fifty families grouped round special workshops, were tried, and—save for quite exceptional cases—rejected as costly and otherwise unsatisfactory. The aim now constantly kept in view is to restore the patient as quickly as possible to his former

* *Med. Record*, 31st July.

occupation, or at least to place him in one closely allied to it. In this way the abnormality of his position is reduced to a minimum, and the benefit of his previous training and experience is not thrown away. To school his mind in the belief that such a resumption of work is perfectly feasible is the first stage of the social treatment, and it is begun as soon as he reaches the orthopædic hospital. When his surgical treatment is ended he is granted leave to return home, but only for a few days. On no account must he be allowed to fall out of the ranks of the industrial army for any lengthy period. In a week or so he must report himself at the nearest orthopædic institution in his district, there to receive further advice and instruction. Needless to say, this institution has a military director, and maintains a strict standard of discipline. Here, while the patient is being drilled physically and mentally, a small committee, consisting of the orthopædist, a member of the Cripple Association, and a representative of the local labour bureau, is busy taking note of his abilities and circumstances, and searching for a post to which these are suited. *A.*, for example, is a paper-hanger, whose left leg has been amputated; he has some artistic talent, which he will be sent to cultivate at a trade-school, and will thereafter re-enter the business of his former employer as a decorator. *B.*, again, is a young farmer who has lost his right arm; practice in writing with his left hand and a course of agricultural science will soon fit him to preside over the business interests of his brother's farm. And so on. Of the first eight hundred cases entrusted to Dr. Biesalski it was found that over 96 per cent. were able in like fashion to resume their former calling.

To attain the desired object, however, the co-operation of the employing classes is obviously necessary. The State, as the greatest of employers, has declared its readiness to set an example in this respect, each of its departments being prepared to reabsorb its own war victims. For the enlightenment of the private employer an active propaganda, combining scientific testimony with patriotic appeal, is kept on foot. In press articles, pamphlets, popular lectures, and exhibitions the cripple's capacity for labour is elaborately demonstrated; and further, since German administrators are seldom content to dispense with all power of coercion, a warning is issued that a clause may appear in future Government contracts dictating what proportion of the work must be allotted to military cripples.

Such is, in outline, the scheme devised and brought into being by Dr. Biesalski. Like most other creations of modern Germany, it is disfigured in our eyes by the all-pervading brand of militarism; and we are scarcely surprised to learn that, having in the course of a year's warfare outgrown the resources of the Cripple Association, it has now passed wholly into the hands of the military authorities. This defect, however, seems inherent not in the principles on which it is founded,

but merely in the manner in which they have been put into practice. Quite similar ideas are developed by Professor Dalla Vedova in an interesting article,[†] and it is impossible not to agree with Mr. M'Murtrie that they are essentially sound.

WAR HONOURS.

IN the recent lists of awards the following members of the medical service are mentioned as having had honours conferred upon them by His Majesty the King:—

The Distinguished Service Order was conferred on Captain KINGSMILL WILLIAMS JONES, M.D., R.A.M.C., for conspicuous gallantry and devotion to duty at Hooge; also on Captain STANLEY ALWYN SMITH, No. 3 Field Ambulance, for conspicuous gallantry and devotion to duty at Festubert (Captain Smith graduated M.D. in Edinburgh University about ten years ago, and came over in the medical service of the first Canadian Contingent); and on Surgeon BASIL ALFRED PLAYNE, R.N., R.N.D., for gallantry and good service during operations near Gaba Tepe in April and May 1915.

The Military Cross on Temporary-Lieutenant THOMAS LEWIS INGRAM, R.A.M.C., attached 1st Battalion the King's (Shropshire) Light Infantry, for conspicuous devotion to duty and energy at Hooge.

The Distinguished Conduct Medal was awarded to H. T. CAMERON, No. 3 Field Ambulance, 1st Canadian Division; J. COMRIE, New Zealand Field Ambulance; G. C. FULHAM, 3rd Field Ambulance, Australian Imperial Force; J. V. F. GREGG-MACGREGOR, 1st Field Ambulance, Australian Imperial Force; A. A. MORATH, Australian Army Medical Corps; C. H. G. ROSSER, 3rd Field Ambulance, Australian Imperial Force; and L. CRAWFORD-WATSON, New Zealand Army Medical Corps.

CASUALTIES.

KILLED in action in the Gallipoli peninsula on 28th August 1915, Lieutenant-Colonel CHARLES ERNEST THOMAS, V.D., of the New Zealand Army Medical Corps.

Lieutenant-Colonel Thomas became a Licentiate of the Royal College of Surgeons of Edinburgh in 1888.

LOST in Transport *Royal Edward* on 14th August 1915, Major JAMES MOWAT, R.A.M.C.

Major Mowat graduated M.B., C.M., in the University of Aberdeen in 1891.

[†] *Il Policlinico*, 1st August.

LOST in Transport *Royal Edward* on 14th August 1915, Lieutenant THOMAS HAYHURST, R.A.M.C. (T.F.).

Lieutenant Hayhurst graduated M.B., Ch.B., in Edinburgh University in 1911.

DIED in the Dardanelles, Surgeon DAVID REVELL BEDELL-SIVRIGHT, R.N.

Surgeon Sivright graduated M.B., Ch.B., in Edinburgh University in 1910, and after graduation occupied several resident posts in the Royal Infirmary. He was a famous Rugby international football player, and in 1909 was the amateur heavyweight boxing champion of Scotland.

KILLED in France on 12th September, Captain HUGH COCHRANE STORRIE, R.A.M.C., attached 2nd Queen's (Royal West Surrey).

Captain Storrie graduated M.B., Ch.B., in Glasgow University in 1908, and M.D. in 1913, and held various resident appointments in Glasgow before entering the service of the Metropolitan Asylums Board.

DIED of wounds in the Dardanelles on 9th September, Lieutenant JOHN CLARKE, R.A.M.C. (T.F.), serving with the 1st Welsh Field Ambulance.

Lieutenant Clarke obtained the Scottish Triple Qualification in 1906.

DIED at Alexandria of illness contracted at the Dardanelles, Captain ARTHUR VERGE, Australian Army Medical Corps, Medical Officer, 6th Regiment, Australian Light Horse.

Captain Verge obtained the Fellowship of the Royal College of Surgeons of Edinburgh in 1908, and was for a time House Physician in the Skin Department of the Royal Infirmary. He was on the staff of the Royal Prince Alfred Hospital, Sydney, as assistant dermatologist.

DIED at Malta of dysentery, Lieutenant JOSEPH M'GOWAN, R.A.M.C.

Lieutenant M'Gowan graduated M.B., C.M., at Glasgow University in 1895 and M.D. in 1905. He was for 17 years in practice in Grangemouth, where he took an active interest in public affairs.

KILLED in action in Flanders, Lance-Corporal GEORGE AUCHINACHIE, Gordon Highlanders.

He was a student of medicine at Aberdeen University, and had been twice previously wounded.

KILLED in France, Lieutenant DONALD R. C. CAMERON, 11th Batt. Highland Light Infantry.

He was in his final year as a student of medicine at Glasgow University.

MILIARY ANEURYSMS, IN RELATION TO CEREBRAL HÆMORRHAGE.

By THEODORE SHENNAN, M.D., F.R.C.S.,
Professor of Pathology, University of Aberdeen.

SIR WILLIAM GULL (1859) was the first to demonstrate the rupture of a miliary aneurysm as the origin and source of a cerebral hæmorrhage. Previously Cruveilhier (1851) had seen "*anérysmes sous l'aspect d'ampoules*" in a case of similar nature, and others had noted the occurrence of dilatations of the cerebral vessels in various diseases of the brain, such as hæmorrhage, softening—both natural and experimental—and in cerebro-spinal meningitis.

Charcot and Bouchard (1868) published a paper based on the examination of 77 cases of cerebral hæmorrhage. In every one of these they found ruptured miliary aneurysms in the lacerated brain substance forming the walls of the hæmorrhagic area, and they concluded that the formation of these aneurysms is an essential preliminary to the occurrence of the hæmorrhage. According to these authors miliary aneurysms are small rounded or spindle-shaped swellings of a diameter varying from 0.2 to 1 mm., occurring on vessels of about 0.25 mm. diameter, the numbers in individual cases varying from two to hundreds; they are found especially on the branches of the lenticulo-striate artery—Charcot's "artery of cerebral hæmorrhage"—but are also seen in the vessels of the pia mater over the convexity, in the cortex, pons, cerebellum, centrum ovale, middle cerebellar peduncle, crus cerebri, and medulla. As Mott points out, this order pretty closely coincides with the order of frequency of the seat of hæmorrhage.

Charcot and Bouchard believed that the aneurysms develop as a result of a primary sclerosing peri-arteritis, with secondary changes in the media; that atheroma of the larger arteries may co-exist, but that this has no direct causal connection either with the aneurysms or with the hæmorrhage, though arteries stiffened by atheroma may transmit the shock of the heart-beat to vessels less able to bear it, and moreover already weakened by peri-arteritis.

A group of investigators, amongst whom Zenker was prominent, believed that the primary change is of the nature of an endarteritis; another, including Eichler, regarded it as a combined lesion, peri- and endo-arteritis. Others blame primary changes in the media,

which may be of the nature of granular or fatty degeneration, or of colloid, hyaline, or amyloid transformation, or calcification, or simple atrophy.

Of the more recent writers, Mott supports Gowers' opinion that the important factor is the loss of contractile and elastic elements, with resulting fibrous overgrowth in the intima and adventitia, but states that the vessels often show indubitable evidence of peri-arteritis, as described by Charcot. Miliary aneurysms "are formed if the muscular and elastic coats are degenerated; the wall of the vessel yields to the pressure of blood; an immature fusiform or sacculated aneurysm develops and is liable to rupture at any time. Probably the reason that these aneurysms are formed especially in the brain is that the walls of the cerebral vessels are relatively thin, and there are but few muscle fibres and vasomotor nerves."

Ford Robertson found miliary aneurysms in large numbers in the thickened pia mater in three cases of senile insanity, and maintains that they can never be pronounced absent by naked-eye examination alone. He believes that the primary change in the vessel is a hyaline degeneration of the intima, this interfering with the passage to the media of nutritive material from the circulating blood, so that, being weakened, the coats of the vessel yield before the blood-pressure. When fully developed the walls of the miliary aneurysm are composed of fibrous tissue only, the muscular and elastic tissue having disappeared. They rarely rupture in the soft membranes, but may readily do so within the brain on account of their lack of support.

Kaufmann describes miliary aneurysms not only on the cerebral vessels, but also on those of the intestine, lungs, and kidneys.

Beattie and Dickson, following the teaching of Greenfield, describe miliary aneurysms as generally resulting from degenerative changes in the walls of arteries, associated with increased blood-pressure; they are of the saccular variety, and are found specially in the brain and retina. They are usually multiple, and occur on arteries which show sclerotic changes, or are minute bulgings of the middle and inner coats, or of the inner coat alone, through degenerated outer coats.

In Pembrey and Ritchie's *Text-Book of General Pathology*, miliary aneurysms are described as round or spindle-shaped, and caused by degenerative changes in the intima, associated with atrophy and sclerosis of the media.

Orth describes aneurysmal dilatations of the smallest cerebral arteries, and even of capillaries; but he also indicates that cerebral hæmorrhage can occur without recognisable pathological changes in the vessels.

Charlewood Turner was the first—as far back as 1882—to cast doubt upon the importance of miliary aneurysms as immediate factors in the causation of cerebral hæmorrhage. He thus long anticipated Eppinger, to whom Pick gives credit for initiating scepticism as to the truth of the hitherto accepted pathology of cerebral hæmorrhage. Turner confirms the statements of Charcot and Bouchard as to the presence of peri-arteritis and its probable importance in relation to the dilatation of the vessel, but he adds, “it seems doubtful whether the extravasation of blood occurred from the rupture of one or more miliary aneurysms resulting from that arterial lesion, or more directly from rupture of vessels weakened by inflammatory softening of their walls. In one case of hæmorrhage no miliary aneurysms were found. In other cases in which they were found all those examined microscopically had thickened walls in which mingling of fibres and spindle-shaped nuclei with the leucocytes gave evidence of a lesion of earlier date and of a less active stage.”

Within recent years German investigators have again questioned the truth of the accepted nature of miliary aneurysms.

Eppinger went so far as to maintain that miliary aneurysms as such do not exist, but are either “so-called” dissecting aneurysms, with accumulation of blood between media and adventitia (appearances also described incompletely by Turner), or are solid swellings in the adventitia, due to collections of cells or degenerated material, blood, fat, or pigment, in the adventitial lymphatic. These may initiate chronic peri-arteritis, with resulting solid swellings of the vessel, the lumen of which may become obliterated. These formations are termed “pseudo-aneurysms” by Kromayer and Ford Robertson, as distinct from “false aneurysms” as generally understood.

In Aschoff's *Text-Book of Pathology*, Ernst states categorically (p. 341) that for fatal hæmorrhage only larger super-miliary aneurysms come into consideration—partly spurious, partly dissecting aneurysms, or rather intra-mural hæmatomata. The latter are collections of blood, either within the adventitial lymphatic, which he refers to as Virchow-Robin's space, or within the space produced artificially by the penetration of the blood between the mesodermal connective tissue, accompanying the vessel, and the

surrounding glial tissue, the so-called His' epi-cerebral or perivascular space. At page 58 of the same volume Benda states that, exceptionally, true saccular or dissecting aneurysms are found.

These statements in Aschoff's text-book are based on the results of the careful investigations of Pick and Ellis, which were carried out during 1909-10. Pick introduced a new method of isolating the diseased vessels, viz. by shaking up the disorganised brain substance in saline solution, slowly, for 8 to 10 hours. These authors found that all the aneurysms discovered in their cases (in all 41) were either false aneurysms or dissecting aneurysms. Primary atrophy of the media, or colloid, hyaline, or amyloid degeneration of that coat, or primary changes in the adventitia, were never found; but they found constantly atheromatous changes in the intima, with secondary changes in the media. The fatal hæmorrhage originated either by rupture of atheromatous vessels or of super-miliary false aneurysms. As regards miliary aneurysms, whose character could be distinguished only by the microscope, they were either various formations simulating aneurysms, or dissecting aneurysms, or spurious aneurysms, *i.e.* encapsulated hæmatomata.

From time to time, as opportunity offered, I have been examining the vessels from cases of cerebral hæmorrhage, but this has been done with greater interest since Pick's paper appeared. I demonstrated some of my results before the Edinburgh Pathological Club in 1912, and at the International Medical Congress in 1913. The results obtained so far correspond very closely with those of Pick and Ellis, and may be now described, the preparations employed for the purpose being selected from five of the cases examined.

CASE I.—Male, æt. 55, died April 1908. Probable syphilitic history. Right-sided subdural hæmorrhage; pontine hæmorrhage, chiefly on right side, with numerous shot-like firmer masses of clot apparently older than the surrounding hæmorrhage. Nodular atheroma of all visible branches of cerebral arteries. Marked hypertrophy of left ventricle. Aorta atheromatous. Most of the medium-sized and smaller arteries of the body atheromatous. Terminal arterioles in the organs, for the most part, showed marked hyaline degeneration of the intima. Arterial sclerosis in kidneys, with secondary atrophic changes in these organs, and mixed chronic nephritis.

The pons was examined by means of large paraffin sections.

Microscopic examination showed numerous hæmorrhages in the

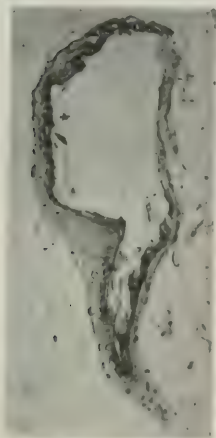


FIG. 1.—Small Aneurysmal (Miliary) Dilatation of a Minute Artery. Case II.

It possesses some of the characters of a true miliary aneurysm. See text. ($\times 105$.)

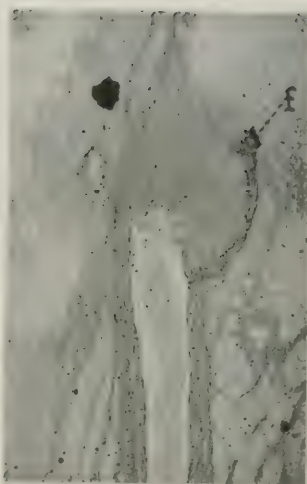


FIG. 2.—Arteriole showing Complete Rupture, and Occluded by Blood-Platelet Thrombus and Fibrin.

f, fold in section. ($\times 75$.) See Fig. 3.

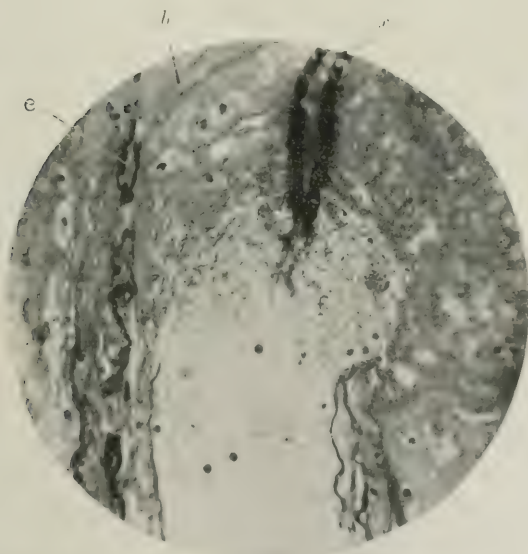


FIG. 3.—High Power View of Termination of Ruptured Vessel shown in Fig. 2. Elastic Tissue Stain.

The elastic lamina, *e*, is split up into layers, and fractured. *b*, blood-platelet thrombus; *f*, fibrin; *x*, fold in section. ($\times 400$.)

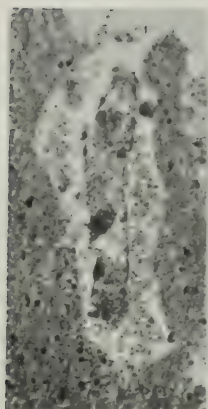


FIG. 4.—Capillary Dilated and with Ruptures in Wall.

Perivascular space contains blood. ($\times 135$.)



FIG. 5. Branches of Lenticulo-Striate Artery from Hemisphere in which no Hemorrhage had Occurred. Case V. (natural size).

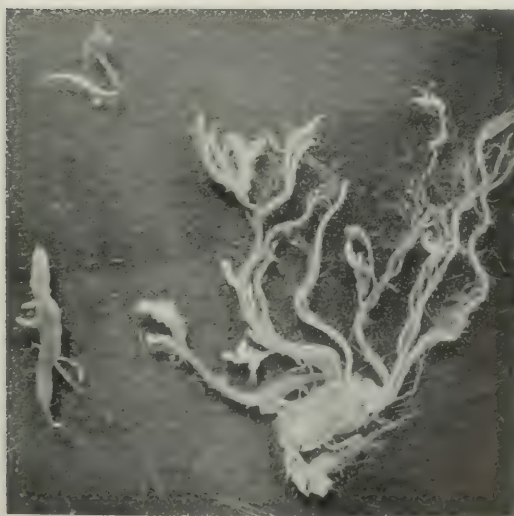


FIG. 6. Vessels from Similar Situation in Hemisphere in which Hemorrhage had Occurred. Case V. (natural size).



FIG. 7.—Small Haematomata in Adventitial Spaces. Larger One simulated a Miliary Aneurysm to Naked Eye.

The ruptured vessel is seen in the lower left-hand quadrant of the figure. *c*, elastica, ruptured; *e*, occluding thrombus; *b*, blood which has escaped from the distended adventitial space. ($\times 32$.)

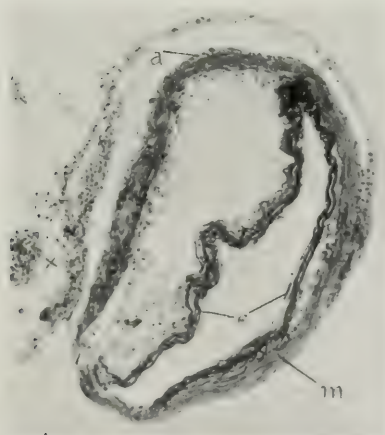


FIG. 8.—Arteriole showing Dissection of Coats by Hemorrhage.

e, elastic lamina, split into layers; *m*, media; *a*, adventitia (letter "*a*" is placed in adventitial space); *n*, point of rupture through wall of adventitial space, found in a section further along the series. ($\times 138$.)

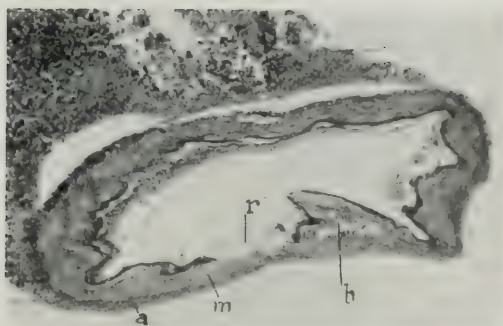


FIG. 9. — Large Artery showing Intima and Elastica Dissected up at "r."

h, blood between elastica and media; *a*, adventitia; *m*, media.
($\times 77$.)



FIG. 10. — Small Arteriole showing Dissection of Intima and Elastica from Deeper Coats, and Displacement in Direction of the Blood-Flow, at (1). At (2) Rupture of Intima, Elastica, and Media, with Hemorrhage.

e, elastica. ($\times 62$.)

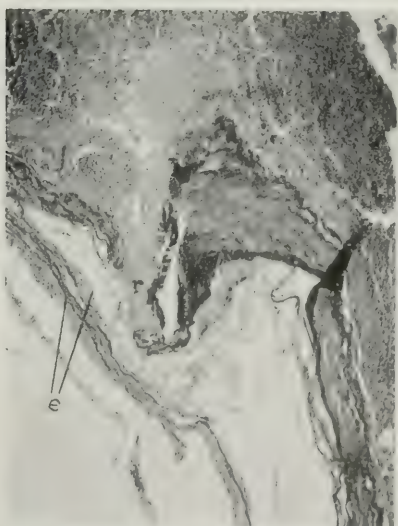


FIG. 11. — Artery showing Rupture in Angle Between it and a Branch.

r, rupture; *e*, elastica split up into layers.
($\times 136$.)

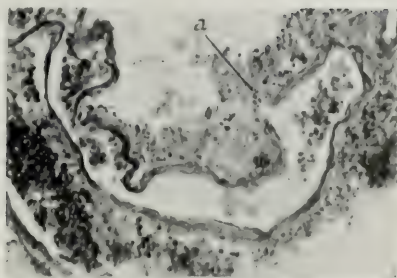


FIG. 12. Small Arteriole showing Rupture of Media and Intima, with Formation of Small Aneurysmal Bulging, *a*, in which a few Leucocytes have Collected. ($\times 135$.)

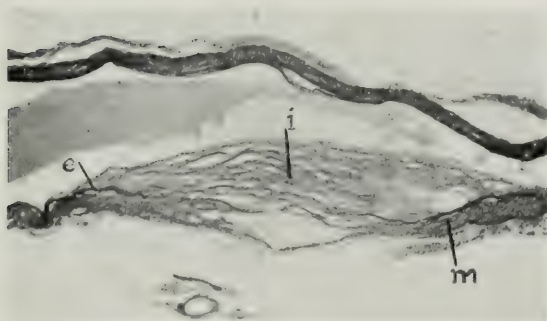


FIG. 13. Arteriole showing Nodular Atheroma.
m, media; *e*, elastica; *i*, thickened intima (letter "*i*" is placed in lumen of vessel). ($\times 75$.)



FIG. 14.—Arteriole showing almost Complete Obliteration of Lumen as a Result of Obliterative Endarteritis.

Collection of "foam-cells," *c*, just internal to elastic lamina, which is stretched. A similar condition extends into a small branch. ($\times 74$.)

substance, many limited by the outer wall of the adventitial space. These corresponded to the shot-like masses observed at the post-mortem examination. In the midst of these collections the sections of the arteries were seen, some moderately dilated, others ruptured from over-distension. Others, and these numerous, were blocked by proliferative endarteritis, or by endarteritis accompanied by thrombosis. Peri-arteritis was commonly seen, and to greatest advantage in vessels a short distance from the hæmorrhages. In some of these arterioles the adventitial space was filled up with vascular connective tissue, apparently of new formation, the smaller vessels often showing hyaline transformation. Frequently also fibrin was seen filling the adventitial space. Hyaline degeneration of intima and of adventitia was seen in many arterioles. No amyloid reaction was detected in any of these vessels.

In this case the hæmorrhage had originated by rupture of diseased vessels, these sometimes undergoing rapid preliminary dilatation. In a few instances the blood had dissected its way between elastica and media (*cf.* Fig. 8). The varying character of the changes in the coats of different arteries was remarkable.

CASE II.—Male, æt. 52, died January 1909. Alcoholism, three months. Chronic Bright's disease, two years. Hemiplegia, three days. Left-sided cerebral hæmorrhage in common situation. Myocardium, diffuse fatty degeneration. Hæmorrhages under endocardium. Chronic mixed nephritis.

Microscopic examination of vessels washed out of wall of hæmorrhagic area, and of serial sections of the wall, showed the following appearances:—

In parts at a little distance from the hæmorrhage the adventitial spaces of the arteries were dilated from oedema. Most of the arterioles showed a moderate degree of endo- and peri-arteritis. Some showed slight increase of connective tissue in the middle coat, with hyaline degeneration. Most of the minute terminal arterioles were approximately healthy, but some showed distinct peri-arteritis. In the hæmorrhagic areas rounded and oval collections of blood (hæmatomata) surrounding the arterioles were found, as in Case I., the blood coming from ruptures in the vessels. These ruptures were usually closed by thrombosis. Fibrin was seen in some of the adventitial spaces. In a few instances the elastica was split up into layers and separated from the media by effused blood.

On one very minute arteriole a rounded aneurysmal dilatation was found, 0.2 mm. in diameter, this being about three times the diameter of the vessel. The distended coats of the vessel were

followed over more than half the circumference of the dilated part, but in the remainder the wall appeared to be formed of thinned adventitia alone. This structure was the only one seen in any of the cases which approximated at all closely in its appearance to the classic description of miliary aneurysms (Fig. 1).

In this case the hæmorrhage had taken place as a result of rupture of diseased vessels, sometimes with a preliminary dissection through their coats.

CASE III.—Male, æt. 57, died February 1913. Alcoholic; very adipose. Left-sided hæmorrhage into basal ganglia. Moderate hypertrophy of left ventricle, with chronic fibroid changes in the myocardium. Kidneys, old infarcts; only moderate amount of chronic interstitial change. Bladder, numerous coalescing hæmorrhages over fundus.

The lacerated brain substance was shaken up in saline solution, according to Pick's method, and the isolated arteries cut serially in paraffin. Appearances similar to those described in the other cases were found. An arteriole with a knob-like termination was examined specially, as its appearance corresponded to that of a miliary aneurysm. The knob proved to be a dome-like thrombus occluding the ruptured vessel. At first sight the vessel appeared to be healthy, but on appropriate staining the elastica was found to be split up into layers, and was fractured in the neighbourhood of the rupture (Figs. 2 and 3). Further, the intima showed slight patchy thickening, and the inner layers of the adventitia throughout were hyaline.

CASE IV. had a history, and showed naked-eye appearances similar to those described in the last case. In addition to the microscopical appearances described in connection with that case, I found great dilatation of the capillary blood-vessels, with small ruptures in their walls (Fig. 4).

CASE V.—An old formalin-preserved brain, with hæmorrhage into the basal ganglia. No history or post-mortem record available. This brain gave the best results of any I examined, and most of the illustrations are from preparations made from it. The vessels were pulled out of the lacerated tissue surrounding the hæmorrhage, or were carefully dissected out.

The branches of the lenticulo-striate artery on the side without hæmorrhage (Fig. 5) showed no aneurysms, or swellings simulating aneurysms, but some of the arterioles were slightly thickened; whereas those from the side on which hæmorrhage occurred showed marked alterations (Fig. 6), the smaller vessels displaying rounded, spindle-shaped, or irregular purplish swellings. The separate lizard-shaped vessel, to the left of Fig. 6, shows in its lower part its approximately

normal size, and, above, the great enlargement due to dissection of the blood along the adventitial space. The vessel at the top left-hand corner of the figure, in addition to atheromatous thickening, had a rounded berry-like swelling upon it, about 2 mm. in diameter. This, unfortunately, gave way while it was being photographed. When examined under the microscope the smaller swellings proved in most cases to be hæmatomata, and, with care, the site of the rupture of the vessel connected with the hæmorrhage could be demonstrated (Fig. 7). Other vessels showed the characters of dissecting aneurysms, as illustrated in Fig. 8. The elastic lamina is seen to be split up into several layers, and to have given way at the bottom of the figure. It is separated from the media by extravasated blood, and the media also has given way near the point of rupture of the elastic layer. The inner layers of the adventitia remain attached to the media, and they are not thickened to any extent. Blood has also escaped into the adventitial space, and from this has penetrated to the brain substance. The intima of this vessel in other sections showed slight patchy thickening. Fig. 10 shows dissection of blood through the coats of a smaller vessel, and Fig. 11 shows rupture of a vessel in the angle between its branches. In addition, local ruptures of intima and media were found, leading to the formation of minute aneurysmal bulgings at one side of the vessel (Fig. 12). In the case of some arterioles localised yellowish swellings were due either to nodular atheroma, as shown in Fig. 13, or to a form of proliferative endarteritis, with a collection of "foam-cells" next to the elastic lamina (Fig. 14).

Conclusions.—Cerebral hæmorrhage results from

1. Rupture of diseased arterioles, which may undergo a preliminary local dilatation. This dilatation probably in most cases immediately precedes the rupture, and is not pre-existent in the form of an aneurysm. These local dilatations vary greatly in shape and size, but are usually of larger size than is associated with the term "miliary." The importance of the last point seems to be over-emphasised by German writers. Or—

2. It may follow the formation of a dissecting aneurysm, which develops in a manner similar to that of dissecting aneurysms occurring on the large arterial trunks.

True miliary aneurysms are not at all common, if, indeed, they exist at all, at the sites of cerebral hæmorrhage.

Miliary aneurysms may be simulated by small collections of blood or fibrin, or of cells in the adventitial space; by localised solid swellings of the coats of the vessel—nodular atheroma, endarteritis, or a combination of endarteritis and peri-arteritis—or by small occluding thrombi.

The statement of Charcot and Bouchard that peri-arteritis is commonly present is correct.

Seeing that in these cases arterioles elsewhere in the body are also diseased, it may be presumed that the reason why they have an especial tendency to rupture in the brain substance is that their walls are thinner, or at least more friable, and that they are less perfectly supported by resistant connective tissues than elsewhere in the body, and, moreover, are surrounded by a large adventitial lymphatic.

Further investigation is required before we can finally accept the statement that miliary aneurysms have no connection at all with cerebral hæmorrhage.

But it appears to be necessary to prove, by employment of modern methods, whether miliary aneurysms actually exist. In the foregoing cases I found only one structure at all corresponding to the description of them. Such investigations should include not only the arteries at the site of the hæmorrhage, but also, at least, those in the opposite hemisphere and those in the pia arachnoid.

The statement that miliary aneurysms are present in most cases of co-existent chronic heart and kidney disease (Rose Bradford and others) also requires further investigation and proof.

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STUDIES FROM THE PATHOLOGICAL DEPARTMENT
OF THE UNIVERSITY OF EDINBURGH.

CASE VI.

CASE OF MYXŒDEMA.

Day Book, 1049.

Museum Book, 661.

THE patient was an old woman, aged 69, who began to complain to her doctor about ten years ago. She noticed that her eyebrows were becoming scanty, that her hair was falling out, and that she became breathless on exertion. The doctor observed, in addition, that her skin was peculiarly dry and wrinkled, with an appearance like tissue paper. He ordered a course of thyroid treatment, but after a short trial she refused to continue it. A year or two after this the same doctor saw her again. The symptoms of myxœdema were now more marked. Supraclavicular pads of fat had formed, the speech was slow and slurring, and the memory was affected. The breathlessness was also more marked. Thyroid was again ordered, but was taken by the patient for a short time only. Her medical attendant reports that he met her occasionally in the streets after this, and that he noticed a progressive deterioration in her appearance. The skin of the face became sallow and the eyelids puffy, while the previously mentioned symptoms developed further. A short time before her admission to hospital he saw her again, and had an opportunity of examining her. The heart was found to be in a very bad state, and there was œdema of the lower limbs. She was admitted to hospital on 1st June.

At this time the patient complained of dryness of the skin, falling out of the hair, and dropsy of the legs. She gave as the duration of her illness three years; but, as is evidenced by the report of her doctor, she showed signs of the disease ten years previously. Her own account of the sequence of events was that the swelling of the legs first troubled her. These became stiff, and sometimes she was unable to stand. The skin began to change colour and texture about two years before. She also noticed that her hair was falling out and that she could not hear well. Her account of the reason why she could not continue the thyroid treatment was that the taking of it made her dizzy, and that tingling sensations developed in the arms, preventing her hands from gripping.

On examination the skin was found to be very dry, hard, and thickened; it showed generally a yellow colour. The face appeared aged beyond the patient's years. The hollows below the eyes were filled up and the conjunctival aperture narrowed. The lips appeared

to be thickened. The hair was grey, coarse, and very thin. There was cedema of the legs and feet. The heart was enlarged, extending $1\frac{1}{2}$ inches outside the nipple line. The heart-sounds were feeble but closed (*i.e.* there were no murmurs). The pulse was small and the blood-pressure low. The arteries were greatly thickened.

As regards sensations, the patient complained of feeling the cold very much, although the weather at the time was warm. There was no impairment of sensibility to touch, heat, tickling, or pain. The muscular sense was unimpaired. The sight was fair, the pupils equal and reacting to light and accommodation. The hearing was very defective. There was nothing to note about the motor functions. The intelligence was sluggish, but the memory appeared to be unimpaired. (Subsequent comparison between the patient's statements and those of her doctor belied this.) The speech was very slow but accurate. She slept well. The urine was found to be alkaline, the specific gravity 1023; the colour was light. There was a deposit of mucus and phosphates. Albumin was present in small amount. There was no blood, sugar, or bile. On microscopic examination hyaline and granular casts were found, along with triple phosphate crystals. The breathing was regular, but at times there was dyspnoea. Cough was sometimes troublesome, but there was scarcely any sputum. On examination of the thorax a hyper-resonant note was elicited anteriorly. The breathing was harsh vesicular with a few ronchi.

As regards the treatment and progress of the case, three days after admission to hospital 2 grains of thyroïd were given. This was followed about an hour after by great pain in the arms. Aspirin was administered, which relieved the pain and sent her to sleep. Two days afterwards potassium iodide was given, as the pain was thought to be arterial in origin. This seemed to do good. Two days after this the patient became more breathless. Œdema of the skin of the back and of the right pleural sac developed. Next evening (9th June) the patient suddenly became very pale and breathless, and died in 10 minutes in spite of the administration of hypodermic stimulants.

Throughout her stay in hospital the patient's temperature was normal or subnormal, more commonly the latter. It varied during the nine days from $96\cdot5^{\circ}$ to $98\cdot4^{\circ}$.

The post-mortem examination was performed two days after death.

The notes are as follows :—

The body is that of an old woman. There is marked pallor of the skin and œdema of the lower limbs and tissue of back and neck.

The abdomen is prominent. There is a large amount of subcutaneous fat, notably in the abdominal wall and over the clavicles. The muscles are very pale.

The abdominal cavity contains a large amount of clear yellow fluid.

There is a large excess of fluid in both pleural sacs, and the peri

cardial sac contains a small quantity of turbid fluid. There are firm adhesions between the apices of both lungs and the domes of the pleural cavities.

The œsophagus shows some dilatation and tortuosity (varicosity) of the veins in the lower part. The bronchial mucous membrane is pale, and in the lumen of the larger tubes there is a frothy secretion.

In the region of the thyroid gland there is a mass of fibrous tissue. It is difficult to ascertain the exact size of the gland owing to the absence of glandular structure, which would enable one to define its limits. The mass of fibrous tissue which appears to represent the gland gives the following measurements:—Right lobe, $3.8 \times 1.5 \times 5$ cm.; left lobe, $2 \times 1.8 \times 5$ cm. The lowest portion of the right lobe extends down to the lower border of the 4th tracheal ring.

Lungs.—The lungs are pale, and show cicatrisation at both apices and emphysema of the anterior borders. On incising the apices interstitial change, with one or two small, hard, pigmented nodules, is found. On pressing any portion of the incised lungs frothy fluid can be expressed.

In addition to this, which indicates œdema, the lower and posterior portions of the lungs are congested.

Heart.—The organ is enlarged and ovoid rather than conical in shape. The anterior surface of the right ventricle is completely covered with fat. *On Section:* The layer of fat is found to be thick and to be infiltrating the muscles of the right ventricle, so that it is impossible to say where the fat ends and the muscle begins.

There are some minute (petechial) hæmorrhages under the pericardium. The heart muscle generally is pale, soft, and very friable. The inner (endocardial) portion of the muscle is paler than the outer.

All the cavities are dilated, but more especially those on the right side.

The valves are healthy, with the exception of the mitral, which shows a small amount of fibrous thickening.

Aorta.—The thoracic aorta shows numerous raised yellow patches, which tend to be confluent. These are found throughout the vessel, but become more extensive in the lower part of the descending portion. Still more marked is this atheromatous change in the abdominal aorta, especially above the bifurcation, where the intima has disappeared and the necrotic pulpy material is exposed. Calcification is practically absent.

The nodular, atheromatous change is found to extend into the larger branches of the aorta—coronaries, carotids, renals, etc.

Liver is small. It shows fibrous adhesions, on its anterior surface, to the abdominal wall. There is considerable green (post-mortem) discoloration of the organ where it comes into contact with the hollow viscera. The liver substance is pale, soft, and friable.

Stomach is greatly dilated, and shows post-mortem discoloration and softening. The mucous membrane is pale.

Small Intestine.—Contents—pale semi-solid material. Mucous membrane pale.

Large Intestine.—Beyond pallor of the mucous membrane, there is nothing to note.

Spleen not enlarged. It is adherent to its surroundings, and is soft and pale.

Suprarenals.—Both appear small. Length of right, 4 cm.; of left, $3\frac{1}{2}$ cm.

Kidneys.—Both kidneys are reduced in size. Right measures $9 \times 4\frac{1}{2}$ cm.; left, $10 \times 4\frac{1}{2}$ cm. The cortex is narrowed; the capsule thickened and adherent in places. On stripping the capsule an irregular and rough surface is exposed, with numerous subcapsular cysts.

Uterus is somewhat enlarged, and shows several fibro-myomata, varying in size from a pea to a pigeon's egg.

Brain is very soft and friable. *On Section*: The substance is pale and glistening, indicating the existence of œdema. Pituitary body is soft and friable, but not altered in size.

MICROSCOPIC APPEARANCES.

Thyroid Gland.—The piece of tissue which represents the thyroid gland is found to be composed almost entirely of well-developed connective tissue. Very little trace of thyroid structure can be found. Only an occasional acinus, which may or may not contain the characteristic structureless, homogeneous material (colloid), can be found. One such acinus, lined with cubical epithelium and containing colloid, is shown in Fig. 3. There is, however, sufficient gland structure to make it certain that the piece of tissue does represent the atrophied thyroid gland. As stated above, the fibrous tissue is as a rule well developed; but in parts, especially in the neighbourhood of the still remaining acini, groups of small round mononucleated cells can be found. Such groups, composed of lymphocytes, small fibroblasts, and other similar cells, give the key to the process by which in all probability the gland was brought to its present atrophied condition.

The vessels of the thyroid, both the larger ones surrounding the gland and those within the gland itself, show very marked changes. These changes will be described under the heading of "Vessels."

Heart.—There is a thick layer of fat in the subepicardial tissue, and in places this fat can be seen extending downwards between the muscle fibres. This "fatty infiltration," or lipomatosis, is more marked in the wall of the right ventricle. In sections stained specially to demonstrate fat none can be found within the muscle cells; but there is a very large amount of brown pigment within the cells, a condition often found as a result of senile change and in wasting diseases, and, when it causes



FIG. 1.—View of Trachea with Remains of Thyroid Gland; Aorta with Atheroma seen Below (naked-eye).



FIG. 2.—Abdominal Aorta with Advanced Atheroma; Fibrosed Left Kidney (naked-eye).

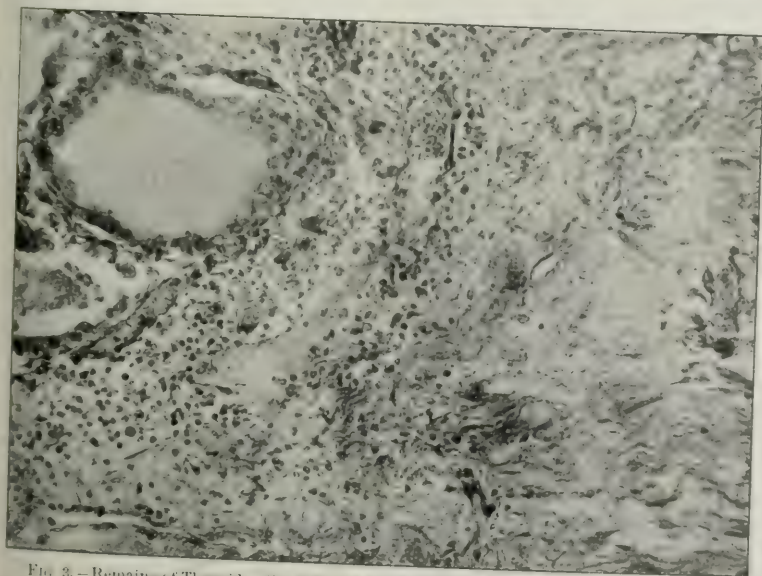


FIG. 3.—Remains of Thyroid; Gland Tissue being Replaced by Fibro-Cellular and Vascular Tissue ($\times 200$ diam.).

marked brown colouration to the naked eye, known as "brown atrophy." The vessels of the heart show a certain amount of the intimal thickening so pronounced in other viscera, but it is not marked. Following from this there is no great increase of fibrous tissue, although small patches of interstitial change can be made out here and there.

Vessels.—*Aorta* shows well-marked thickening of the intima, with extreme degenerative change, so that the deeper parts of the intima are transformed into necrotic material mixed with fat, which is well demonstrated in preparations stained with Sudan III. The media shows little change beyond small groups of round cells here and there. Calcification is not a striking feature in the aorta. Preparations stained by Weigert's elastic tissue method show splitting and fragmentation of the elastic fibres in the intima.

Coronary.—There is a slight general thickening of the intima, with fatty degeneration in the protoplasm of the spindle-shaped cells composing it. The internal elastic lamina is swollen, and also stains with selective fat dyes. The media shows a few small patches of fatty change.

Arterioles.—The smaller arteries of the body generally, but more especially those in the neighbourhood of the thyroid gland, show very marked alterations. These consist in a thickening of the intima which, in the case of some of the thyroid vessels, leads practically to obliteration. This thickened intima shows extreme degenerative change, with calcification as well as fatty transformation. This change is also marked in the vessels of the kidney, but calcification is not such a striking feature in that situation. Similar changes, but of a less marked degree, are to be found in the vessels of the heart, liver, pancreas, spleen, etc.

Spleen.—The sinuses of the spleen pulp are distended with blood. There are numerous swollen endothelial cells containing blood pigment. The arterioles show thickening of their intima.

There is believed to be a close association between the three endocrinous glands—the thyroid, suprarenal, and pituitary. In view of this an investigation of all these glands is of importance.

Pituitary.—The glandular lobe, which is the one usually affected in these cases, shows no striking alteration except a deposit of rounded masses of calcareous material in and between the cells. The change which one would expect to find in a gland such as the pituitary, which is believed to be complementary in its activities to the thyroid gland, is hypertrophy and evidence of increased glandular activity. No such change is found in this case; in fact, the appearances are rather degenerative in character.

Suprarenal.—Portions of the gland were placed in chromic acid (2 per cent.); others were fixed in formalin and cut in gum; others were passed through into paraffin. Unfortunately, owing to autolytic changes occurring as the result of the long interval between death and the carrying out of the post-mortem examination, little can be said about

the appearances in the suprarenal. No alterations of an important nature were observed.

Skin.—A portion of skin from the neck was examined, and showed the following points:—There is distinct thinning of the epidermis. The cutis immediately subjacent to the stratum Malpighii shows wide spaces and branched and spindle-shaped cells, but the deeper parts of the cutis are fairly dense. Hair follicles are absent, and sweat and sebaceous glands are very few and show evidence of atrophy. There is some thickening round the medium-sized vessels.

Nerves—Sections were made of the vagus and phrenic nerves, but beyond some fibrous overgrowth round the nerve there is no alteration.

Lungs.—The portion of lung examined, taken from the lower and posterior portion of the left organ, showed partial collapse, as evidenced by the approximation of the walls of the air vesicles to one another, congestion of the vessels, and a certain amount of shedding of the endothelial cells lining the air sacs (catarrhal change).

Uterine Tumours.—A section of one of these shows the characteristic appearance of a myoma. Bundles of spindle-shaped non-striated muscle fibres can be seen cut in various directions and intersected by a well-formed fibrous stroma. This fibrous stroma is relatively large in amount.

Liver.—The capillaries towards the centre of the liver lobule are dilated, and the columns of liver cells in this position correspondingly atrophied. This shows the existence of chronic venous congestion. Sections stained with Sudan III. show fat in excess within the liver cells. In such sections, also, fat is found in the thickened intima of the arterioles within the portal tract. There appears to be some increase in the amount of fibrous tissue in the organ, but it is not a striking change.

Pancreas.—Owing to the long period which elapsed between death and the section, the glandular elements of the pancreas are found to stain badly. Nothing very much can therefore be said about the gland itself. The vessels show no very striking change.

Kidney.—There is a striking general increase in the amount of fibrous-supporting tissue in the organ. This is much more marked in some areas than in others. The change is specially well brought out in preparation stained with pierofuchsin (van Gieson's stain), the red of the fibrous tissue contrasting well with the yellow of the glandular elements. As a whole, this tissue is well developed (*i.e.* relatively of long duration), but in places there are groups of small round cells indicating that the process is still in progress. The capsule of the organ is thickened. The vessels, more especially the medium-sized ones running upwards through the cortex, show the changes described under vessels. This is an important point, and is to be regarded as the primary condition causing the chronic interstitial change.

The tubular epithelium shows a lack of staining as regards the nucleus, but this is in large part due to post-mortem change.

The glomeruli do not show any marked alteration, except in the aforementioned fibrosed areas, where they are often to be seen only as round knots of fibrous tissue.

In sections stained for fat a small amount of fatty material is to be found in some of the swollen and granular cells of the convoluted tubules. There is also fat present in the thickened intima of the arteries.

SUMMARY AND DISCUSSION OF THE CASE.

In the above case two distinct conditions are to be recognised—first, the fibrous atrophy of the thyroid gland: second, the cardiovascular disease, with dependent renal and circulatory disturbance.

As regards the first, the case is a typical one of myxœdema, both as to the clinical features and the pathological findings. It has long been established, not only by the observation of cases similar to the present one, but also by removal of the gland in man and animals, that destruction of the thyroid substance leads to a train of symptoms to which the term myxœdema has been given. The origin of the term is to be found in the myxomatous and œdematous changes which are found in the skin in such cases. The relationship of the condition to an absence of thyroid secretion is to be found, further, in the beneficial effects which result on the administration of thyroid gland or thyroid extract.

The case under consideration is a typical one in most respects. The sex of the patient should first be noted. Myxœdema is seven times more common in the female than in the male. As a rule, the disease first shows itself between the ages of 40 and 50. Undue sensitiveness to cold, swelling about the face and eyelids, falling out of hair, dryness of skin, increase of fatty tissue generally, yellow colour of face, deafness, slow mental condition—all features of such cases—are exemplified in the present instance.

The pathological change found in the thyroid is also the one characteristically present in the disease, namely, a fibrous atrophy. Only the merest traces of glandular structure are to be found. As to the cause of this fibrous transformation nothing is certainly known. In a certain number of instances the disease is preceded by an enlargement of the thyroid, of the type known as exophthalmic goitre. There is no history of such an enlargement ever having existed in this case. In the present instance there is the presence of striking changes in the vessels supplying the gland. Such disease, resulting in narrowing of arteries, is a well-known cause of fibrous changes in organs. At the same time there appears to be a fair amount of blood in the organ, and although arterial degeneration is not uncommon in cases of myxœdema it is by no means constantly present.

The effects of the absence or atrophy of the thyroid are due to the loss of the autacoid contained in the internal secretion of the gland. The autacoid actively influences the metabolic processes of the body, either directly or indirectly promoting the nutrition of certain tissues, especially the connective tissues and the tissue of the nervous system. In the present case the alterations in the connective tissue were well marked, both clinically and pathologically. As regards the changes in the nervous system, owing to the long period which elapsed between the death of the patient and the post-mortem examination, little was to be expected from histological investigation, and nothing striking was found.

As already stated, there is believed to be some connection between the activities of other endocrinous glands, such as the pituitary and suprarenals, and the thyroid gland. In some cases of myxœdema complementary hypertrophy of these glands has been observed. In the present case no such enlargement existed. Indeed, the appearances in the pituitary were rather those of degeneration.

In the second place, we have the cardio-vascular condition. Arteriosclerosis of the atheromatous type is common in cases of myxœdema, but in this particular instance it was a more than usually marked feature. The disease is most advanced in the aorta and in the arterioles of the internal organs. The chronic interstitial change in the kidneys is to be ascribed to the want of nourishment through narrowing of the vessels. The naked-eye appearance of the kidney—irregularly distributed areas of atrophy leading to depressions in the surface of the organ—is characteristic of what is often called arteriosclerotic kidney, which is one type of chronic interstitial nephritis. The relationship between the disease of the vessels and the atrophy of the thyroid gland has already been discussed. The appearances are quite in keeping with the view that the gland underwent atrophy first, and that the vessels through want of use degenerated more markedly than those in other parts of the body.

The fatty infiltration of the heart is an important point in the case, and in conjunction with the arteriosclerosis it led to dilatation of the organ, more especially the right side, and secondarily to a degree of backward pressure in the venous system, evidenced by the chronic venous congestion of the liver. The patient had recurring attacks of heart weakness, and as a result of one of these severe symptoms developed, for which she was admitted to hospital. The heart failed to recover with rest, dropsy of the serous cavities set in, and eventually the heart failed altogether, causing the sudden death of the patient. It is probable that the lipomatosis of the heart is, in this particular case, a nutritional change, due, like the skin changes, to an absence of thyroid secretion.

For information regarding the early history of the case I have to thank Dr. Robertson. For permission to publish the extracts from the clinical notes thanks are due to Professor Gulland.

JAMES MILLER.

CLINICAL RECORDS.

CASES FROM THE EAR AND THROAT DEPARTMENT
OF THE ROYAL INFIRMARY, EDINBURGH.

UNDER THE CARE OF

A. LOGAN TURNER, M.D., F.R.C.S.E.,
Surgeon to the Department.RETRO-PHARYNGEAL ABSCESS—FIBRO-SARCOMA OF ORO-PHARYNX—
FOREIGN BODIES IN LARYNX.

THE first two cases described here illustrate two conditions of the oro-pharynx. Additional interest is attached to them from the fact that both the patients attended at the clinic on the same day and were examined within a few minutes of each other.

CASE I.—Chronic Glandular Retro-Pharyngeal Abscess in an Adult.—L. W., female, married, æt. 50, was sent to the Department by Dr. W. B. Hendry. She complained of an uncomfortable feeling in the throat when swallowing. The symptom was first noticed three months before her admission, and her attention had first been drawn to her condition by the existence of a swelling behind the upper part of the left sterno-mastoid muscle. The swelling was incised by the medical man whom she consulted at that time, and pus was evacuated. The abscess healed readily, and the scar has shown no evidence of breaking down. No further glandular enlargement could be detected on either side of the neck.

The nasal cavities and naso-pharynx presented a normal appearance. Examination with the tongue depressor revealed a large smooth swelling occupying the left half of the oro-pharynx, passing for a short distance upwards behind the soft palate and extending downwards as far as the level of the epiglottis. The left posterior pillar of the fauces and tonsil and the lower edge of the soft palate were pushed slightly forwards by the swelling. Its surface was covered by the mucous membrane, upon which coursed a few slightly dilated veins. It was firm but somewhat elastic to the touch (Plate II., Fig. 2).

A free incision was made in the lower half of the abscess, and a quantity of thick pus was evacuated. No caseous material was detected in it. An examination of the pus was made at the Pathological Department; no tubercle bacilli were detected. Cultures showed a mixed growth of staphylococci and pneumococci.

CASE II.—Fibro-Sarcoma of the Oro-Pharynx.—E. E., female, married, æt. 69, recommended by Dr. Galloway. Kirkealdy, had complained for six weeks of difficulty in swallowing and a burning sensation at times in the right side of her throat. She had first noticed small swellings in the right side of her neck two years before her admission. These had not varied in size until recently, when they had undoubtedly become larger.

Examination of the neck showed enlargement of the superior deep cervical glands on the right side. They were of firm consistence, and evidently adherent to the sheath of the deep vessels. An enlarged gland was also felt beneath the sterno-mastoid muscle. No enlargement of glands existed on the left side.

Examination of the nasal and post-nasal cavities was negative. A large smooth swelling was seen to occupy the right side of the posterior pharyngeal wall, partly concealed by the right posterior faucial pillar, which was pushed slightly forwards. The mass extended upwards behind the soft palate, and at its lower end reached below the level of the epiglottis. The mucous membrane covering it was of normal appearance; there was no ulceration of the surface and no evidence of lobulation. It had the same firm feeling as the cervical glands (Plate II., Fig. 1).

As its malignant nature was suspected, the patient was sent to Mr. Dowden for a second opinion, and for the further object of determining the question of operation. Mr. Dowden reported upon the probable fibro-sarcomatous nature of the growth and considered that the cervical glands were adherent to the carotid. He suggested that a piece of the primary tumour should be removed for microscopic examination, with a view to determining how far the fibrous element predominated. This was done, but unfortunately the piece of tissue was not of sufficient depth to permit of a satisfactory report from the pathologist. The patient refused any further interference.

The two following cases illustrate the value of "suspension laryngoscopy" in the removal of foreign bodies—in the one case from the interior of the larynx, in the other from that part of the pharynx lying immediately posterior to the larynx, the post cricoid region:—

CASE I.—*Removal of an Open Safety-Pin from the Interior of the Larynx.*—J. M., female, æt. 17, while dressing, held between her lips an open safety-pin. She was suddenly seized with a fit of coughing, and during a deep inspiration the pin was drawn into her larynx. At first she felt a good deal of pain in the lower part of her throat, but this soon passed off, and she experienced no further discomfort, except in the act of coughing, when she was conscious of a sharp pain in the region of the larynx. Apparently the cough was the only symptom complained of, as her voice remained unaffected. She had no respiratory difficulty and no dysphagia.

Her medical attendant, Dr. Glover, sent her to the Dumfries Infirmary, where the position of the pin was located in the X-ray Department. As there were no facilities for dealing with the foreign body, she was recommended to the Ear and Throat Department of the Edinburgh Royal Infirmary.

On her admission on 17th February 1915, four days after the accident, no symptoms were complained of. Examination revealed no evidence of any trauma in the pharynx. With the laryngoscope the pin was quite obvious, lying in the mesial plane just below the vocal cords: the hooded end lay posteriorly, while the uncovered point of the pin projected upwards immediately beneath the anterior commissure of the vocal cords. A slight swelling of the mucous membrane below each cord suggested the presence of a little subglottic œdema.

The patient was sent to the X-ray Department, where two skiagrams were taken—an antero-posterior and a lateral view (Plate I., Figs. 1 and 2).

PLATE I.

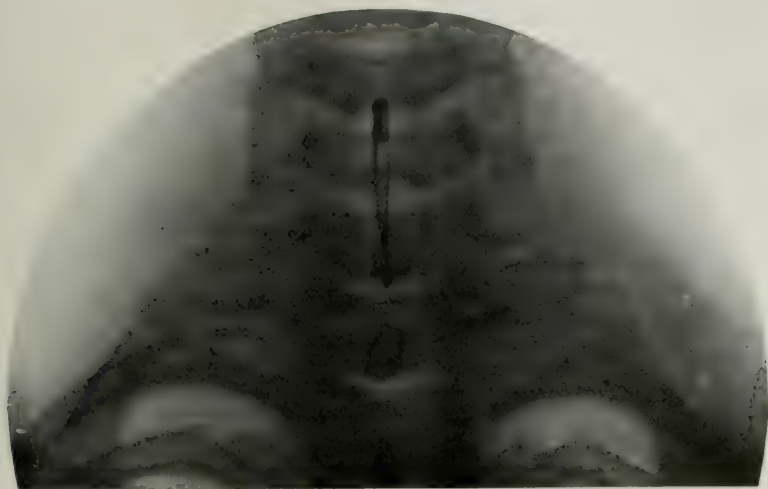


FIG. 1.

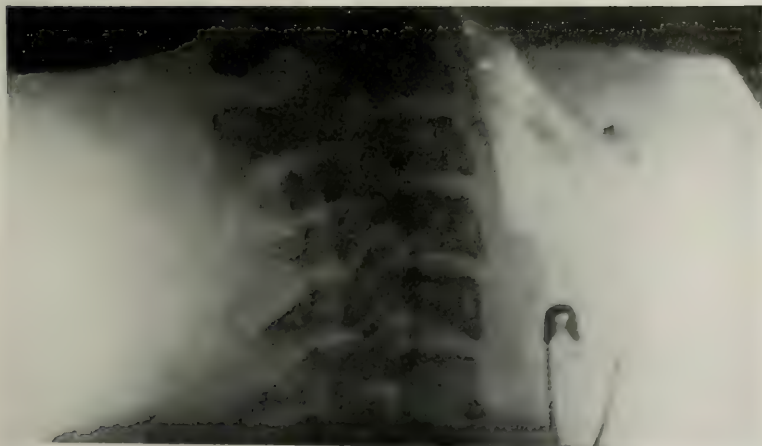


FIG. 2 — Open Safety-Pin in Larynx.

PLATE II.



FIG. 1.—Fibro-Sarcoma of Oro-Pharynx.



FIG. 2.—Chronic Glandular Abscess in Oro-Pharynx.

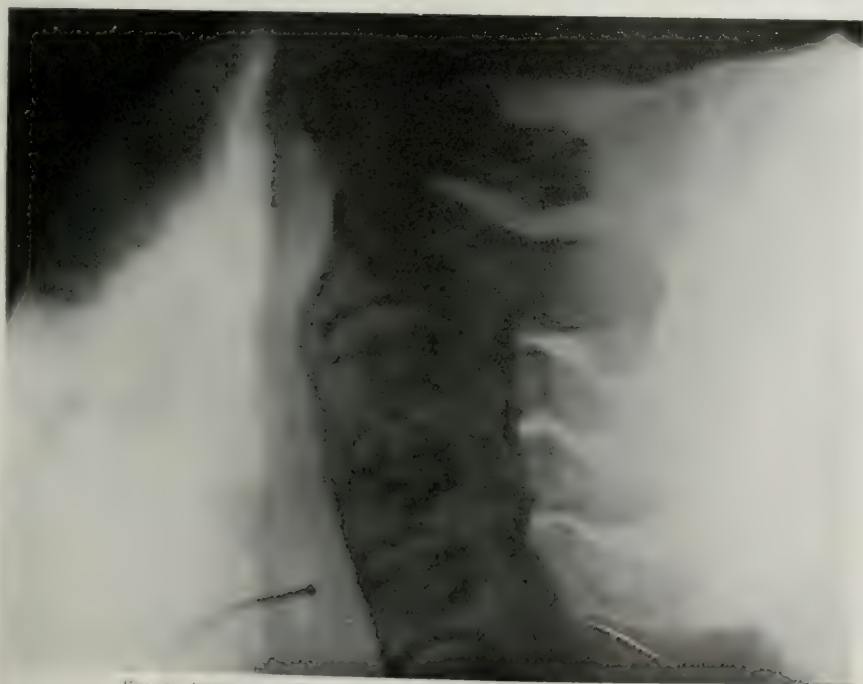


FIG. 3.—Pur in Lower Pharynx with Distal End Embedded in Wall of Larynx.

An injection of atropin ($\frac{1}{120}$ gr.) and morphia ($\frac{1}{8}$ gr.) was given. The upper lip and gums were painted with a 10 per cent. solution of cocaine and a solution of a similar strength was applied to the base of the tongue and epiglottis. The patient was then placed on the operating-table, and the head, dorsiflexed over the end of the table, was fixed in the Killian suspension apparatus. Illumination of the lower pharynx and larynx was got by reflection of light from an ordinary forehead mirror, and an excellent view of the safety-pin was thus obtained. Its position was exactly similar to that seen an hour previously in the laryngoscopic mirror and illustrated in the skiagrams.

A cotton-wool mop, soaked with 10 per cent. cocaine, was then taken for the purpose of further anaesthetising the interior of the larynx prior to the introduction of the extraction forceps, but on again inspecting the larynx for this purpose the pin was found to have disappeared. A good view of the trachea was now possible, but the foreign body was obviously not in it. A glance at the upper part of the pharynx, however, revealed the lower end of the safety-pin disappearing behind the soft palate into the naso-pharynx. As there were no suitably curved forceps at hand to admit of its extraction from the naso-pharynx, the patient was released from the suspension apparatus, and allowed to sit in the upright position, being first cautioned to breathe quietly and refrain from swallowing. A laryngoscopic mirror was then introduced in the ordinary way, and the pin was seen lying across the base of the tongue, just in front of the epiglottis. Its removal from this position was easily effected. No respiratory difficulty supervened, the slight subglottic oedema disappearing.

The case was of interest from the fact that the open safety-pin remained in one position, in the subglottic area, for four days, in spite of the fact that the patient suffered from occasional attacks of coughing. That she had failed to get rid of the pin when coughing was probably due to the fact that the point impinged upon the anterior wall of the larynx below the anterior commissure of the cords, thus preventing its ejection. When she was placed upon her back with the head dorsiflexed over the table in the suspension position, the pin gravitated, so to speak, against the posterior wall of the larynx, thus liberating the point from contact with the anterior wall of the canal. In this way it readily "slipped down" the posterior surface of the larynx and pharynx and lodged temporarily in the naso-pharynx until the upright position was again assumed.

CASE II.—Removal of a Pin from the Post-Cricoid Region, where it was Partly Embedded beneath the Mucous Membrane.—W. R., male, *æt.* 54, while eating his dinner swallowed a pin. He suffered considerable pain in the region of the larynx, and as he experienced difficulty on that account in taking nourishment, he applied for relief at the Royal Infirmary four days after the accident. Through the kindness of my colleague, Dr. Malcolm Fancourtson, he was transferred to my care.

On examination slight alteration in the character of the voice was observed, but there was no respiratory difficulty during quiet breathing. The laryngoscope showed swelling of the mucous membrane upon the posterior surface of the right arytenoid cartilage, and the right vocal cord was immobile close to the

middle line. There was no evidence of the presence of the pin. He was sent to the X-ray Department, where a lateral skiagram was taken. The pin was clearly outlined, lying antero-posteriorly and almost horizontal, with the head evidently lying in the lowest part of the pharynx, while the point and distal part of the body of the pin, slightly bent, projected forwards across the lateral wall of the larynx. The shadow formed by this portion was slightly blurred, as if it had been moved by the respiratory movements (Plate II. Fig. 3).

An antero-posterior view was not obtained, so that the exact relation of the pin to the wall of the larynx was not ascertained. The swelling of the right arytenoid region, however, and the fixation of the corresponding vocal cord justified the assumption that the right crico-arytenoid joint had been injured and that the foreign body lay in close proximity to it.

A hypodermic injection of atropin and morphia was given; cocaine was applied locally as in the previous case, and the patient was placed upon the table in the suspension position. A little difficulty was experienced in this case owing to some stiffness of the patient's neck, but an excellent view of the larynx was obtained. The œdema of the mucous membrane covering the right arytenoid posteriorly was more apparent now than during laryngoscopy. There was no evidence of the pin, however, either within the larynx or in that part of the post-cricoid region rendered visible in the suspension position.

A large œsophagoscope was therefore introduced about one inch behind the larynx, and immediately the proximal end of the pin was observed. The mucous membrane was red and swollen. Adrenalin was then applied in order to contract the tissues. A pair of forceps was introduced through the œsophagoscope, and the pin was grasped close to the head and drawn within the tube and removed. Examination of the larynx two or three weeks later showed complete disappearance of the swelling and normal movements of the right vocal cord.

In this case "suspension laryngoscopy" *per se* was not sufficient to reveal the position of the foreign body. No difficulty was experienced, however, in introducing a full-sized œsophagoscope without removing the suspension apparatus. The shaft of the pin had either entered the mucous membrane sufficiently close to the crico-arytenoid joint to set up inflammation within it and cause a temporary stiffness and immobility or had actually penetrated the joint. There is no record as to whether the pin was bent before being swallowed or had become so during the act of swallowing.

A CASE OF BRONCHO-PNEUMONIA, PURULENT OTITIS MEDIA AND INTERNA, AND LEPTOMENINGITIS: POST-MORTEM: MICROSCOPIC EXAMINATION OF THE EAR.

By JOHN THOMSON, M.D., F.R.C.P.,
Physician to the Royal Hospital for Sick Children :

and

J. S. FRASER, M.B., F.R.C.S.,
Assistant Surgeon, Ear and Throat Department, Royal Infirmary, Edinburgh.

THE following case of acute strepto- (pneumo-) cocal infection of the respiratory tract, middle and inner ear, and subarachnoid space, is of interest in that it explains the occurrence of complete deafness which may occur as a result of pneumonia. In the present case only one ear was microscopically examined and proved to be the seat of purulent otitis media and interna, but it is quite likely that the other ear showed the same condition. If this were so, complete bilateral deafness with consequent deaf-mutism would almost certainly have resulted if the child had survived.

Clinical History.—G. M., female, aged 1 year and 8 months, was admitted to the Dundas Ward, Royal Hospital for Sick Children, on 18th November 1913, with symptoms of meningitis which had lasted for six days. She had apparently always been a puny infant and had been bottle-fed. When ten months old she had bronchitis. At fourteen months she was treated in the Children's Hospital for an attack of pneumonia. At the same time she had a sore throat which ended in a cervical glandular abscess which recovered after simple incision; simultaneously the child developed otitis media which led to a long-continued discharge, but the condition apparently cleared up. At sixteen months she was again a patient in the Children's Hospital with hip-joint disease, and Mr. John Fraser incised and scraped out an apparently tuberculous focus in the neck of the left femur. The wound healed, and the child was sent home a fortnight ago after a period of four months in hospital.

Present Illness.—Six days ago the child became sleepless and irritable, refused food, and cried out when touched. Yesterday (17th November 1913) she had been vomiting, and this has continued. She has not seemed feverish. The bowels have moved regularly. There have been no convulsions.

State on Admission (18th November 1913).—The patient is a small, wasted baby, and very irritable when touched. The pulse and respirations are both rapid, and the temperature is 101.8° F. There is no discharge from the ears and no glandular enlargement; fauces are normal. No definite signs of disease are to be found in any of the

abdominal or thoracic organs. The urine is normal. The leucocyte count is 16,000 per c.cm. There is a faintly positive von Pirquet reaction.

The organic reflexes are normal. No cervical rigidity; Kernig's sign present; eyes normal, and eyesight apparently good. On lumbar puncture a small amount of cerebro-spinal fluid was obtained, not under great pressure; it was slightly turbid from the presence of cells, most of which were lymphocytes. Dr. Carnegie Dickson reports: "The films showed an extraordinary number of *capsulated gram-positive diplococci showing a tendency to form chains*. Practically no cellular reaction. Cultures show pneumococci; a very virulent infection."

Progress.—On the following afternoon (19th November), about 5 P.M., the child became unconscious. The pupils were widely dilated, the conjunctivæ still sensitive to touch; a slight strabismus developed. The hands and feet showed occasional twitching. Towards evening the symptoms became more marked. The bowels continued to act.

On 20th November the patient became rapidly worse. The temperature rose to 105·6° F., and the pulse was feeble and uncountable. The right pupil was more dilated than the left. The respiration rose to 72 in the minute, and there were signs of commencing consolidation in both lungs. In the evening the temperature fell, and the patient became collapsed and died at 9 P.M.

Report of post-mortem examination (from Dr. Carnegie Dickson's notes).

Summary.—Old tuberculous (?) hip-joint disease; pneumococcal meningitis; toxic changes in organs.

Right heart distended with firm adherent ante-mortem thrombus, which extends into the branches of the pulmonary artery and fills most of the auricle and ventricle. Left heart empty. No endo- or pericarditis. Lungs show general chronic adherent pleurisy and *general bronchitis* with patches of collapsed and unresolved *broncho-pneumonia* with general patchy congestion. The left hip-joint was only partly examined. It is apparently the seat of old tuberculous disease, but no certain evidence of tubercle is to be seen. No caseous glands found in any part of the body. The abdominal organs show only toxic changes.

The cerebral meninges are covered by a very abundant *acute fibrino-purulent exudate* of a pale greenish-yellow colour. It is especially marked over the anterior part of the base, the frontal lobes, and the vertex. The convolutions are much flattened and the cerebral tissue very soft. There is from $\frac{1}{2}$ to 1 oz. of free fluid which is only slightly milky in appearance. The spinal meninges are thickly covered on their outer aspect by a copious purulent exudate similar to that over the brain. The meningeal cavity was not opened into before the specimen was put into hardening fluid.

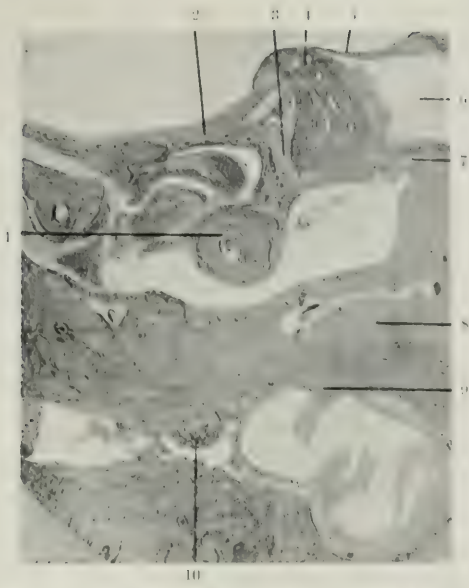


FIG. 1.—HORIZONTAL SECTION THROUGH MIDDLE AND INNER EAR (No. 126. $\times 10$ diam.).

- | | |
|------------------------------|------------------------------|
| 1. Long process of incus. | 6. Eustachian tube. |
| 2. Tympanic membrane. | 7. Tendon of tensor. |
| 3. Chorda tympani. | 8. Facial nerve. |
| 4. Short process of malleus. | 9. Crista of external canal. |
| 5. Tympanic membrane. | 10. Pus in perilymph space. |

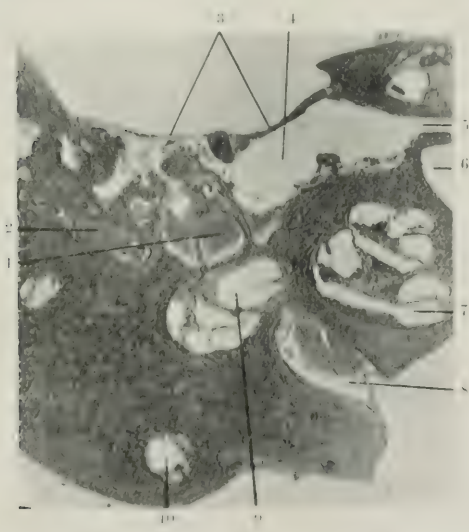


FIG. 2.—HORIZONTAL SECTION (No. 183. $\times 4$ diam.).

- | | |
|-------------------------------|--|
| 1. Pus in hollow of stapes. | 7. Scala tympani of basal coil of cochlea with purulent exudate. |
| 2. Facial nerve. | 8. Internal auditory meatus with cochlear and vestibular nerves. |
| 3. Tympanic membrane. | 9. Vestibule with inflammatory exudate. |
| 4. Anterior part of tympanum. | 10. Smooth end of superior semicircular canal with exudate. |
| 5. Eustachian tube. | |
| 6. Carotid canal. | |

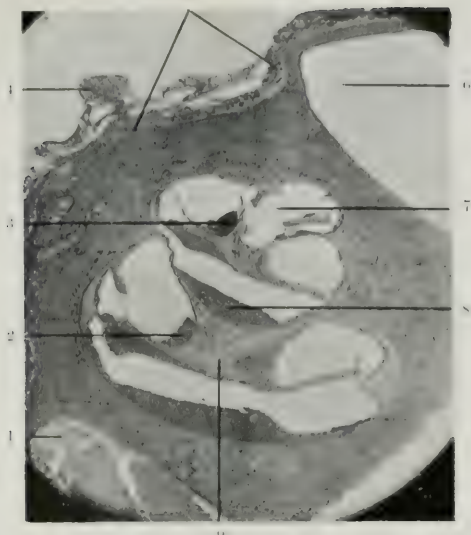


FIG. 3.—HORIZONTAL SECTION. (No. 183. $\times 10$ diam.).

1. Internal meatus showing purulent infiltration between fibres of vestibular nerve.
2. Pus in scala vestibuli of basal coil of cochlea.
3. Haemorrhage in scala vestibuli of middle coil.
4. Pus in tympanum.
5. Swollen, engorged, and infiltrated mucosa of tympani cavity.
6. Carotid canal.
7. Helicotrama.
8. Pus in scala tympani of middle coil of cochlea.
9. Modiolus.

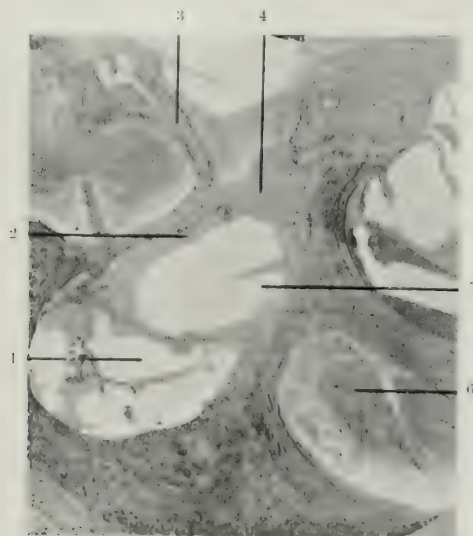


FIG. 4.—HORIZONTAL SECTION. (No. 183. $\times 10$ diam.).

1. Utric containing pus.
2. Fibrinous and purulent exudate in vestibule on inner side of stapes footplate.
3. Anterior crus of stapes.
4. Anterior margin of oval window.
5. Ruptured sacculus with inflammatory exudate.
6. Internal meatus with vestibular and cochlear nerve. The former is infiltrated with pus cells.

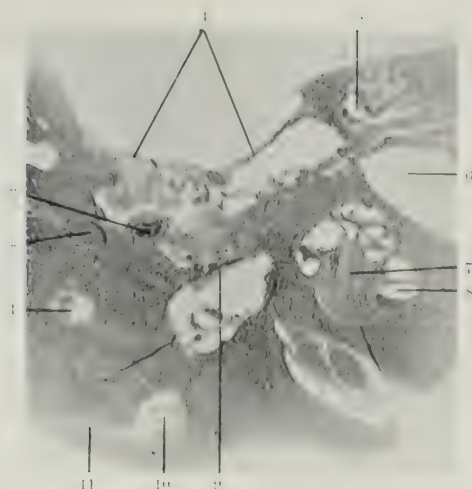


FIG. 5.—HORIZONTAL SECTION. (No. 204. $\times 4$ diam.).

- | | |
|---|---|
| 1. Smooth end of external canal with inflammatory exudate in perilymph space. | 6. Carotid canal. |
| 2. Facial nerve. | 7. Modiolus of cochlea. |
| 3. Stapedius. | 8. Scala tympani of basal coil of cochlea with pus. |
| 4. Tympanic membrane. | 9. Exudate on inner side of stapes footplate. |
| 5. Tubal air cell containing inflammatory exudate. | 10. Crus commune. |
| | 11. Smooth end of posterior canal. |

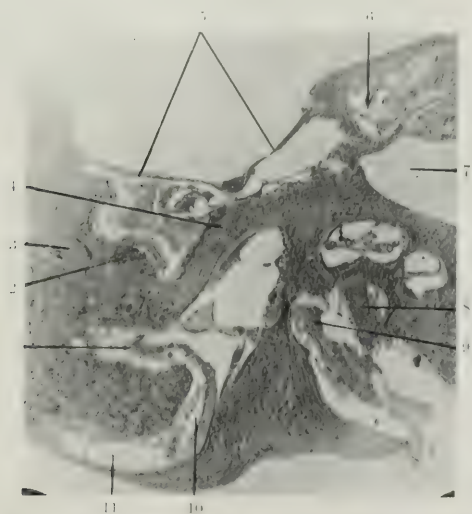
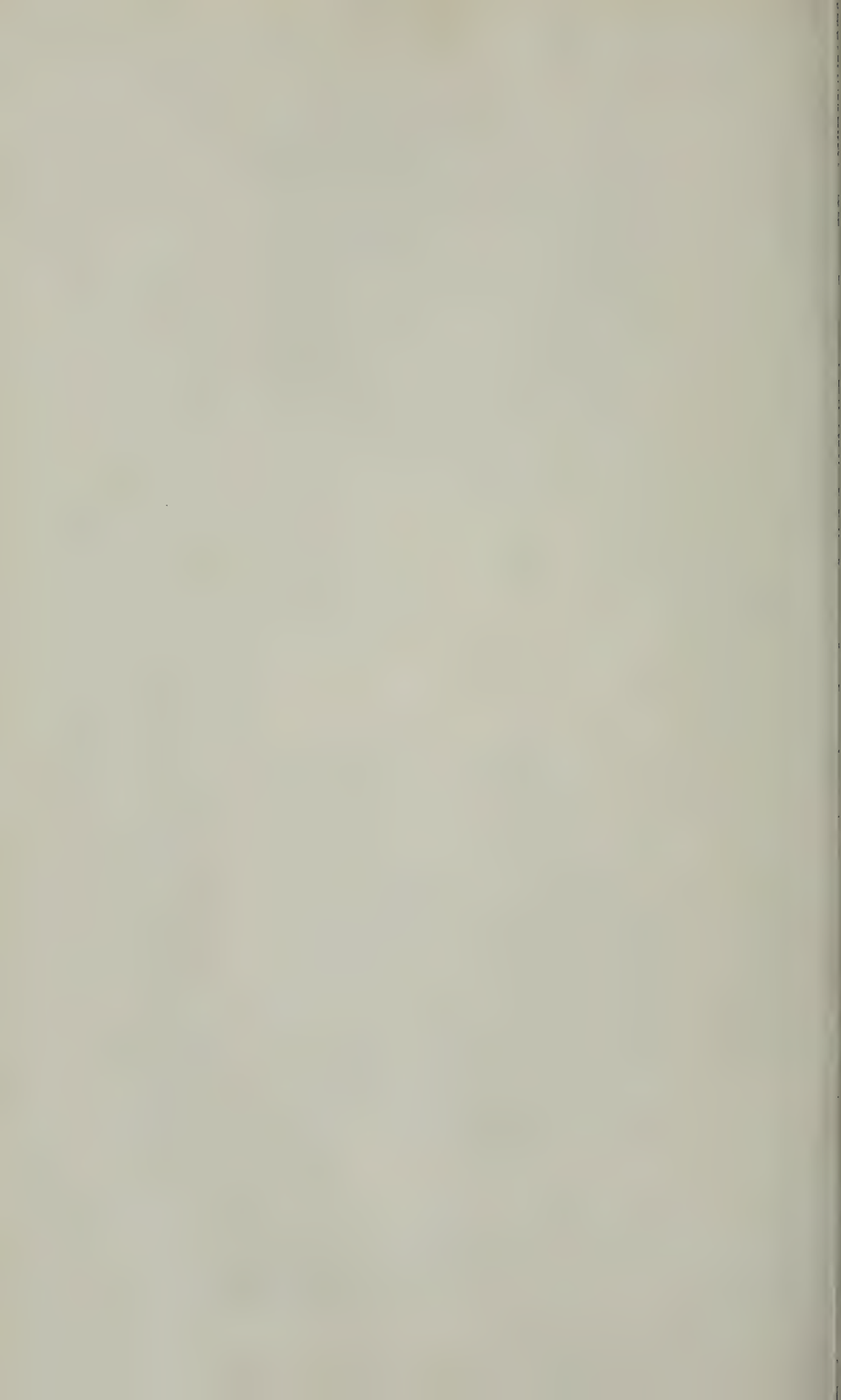


FIG. 6.—HORIZONTAL SECTION. (No. 228. $\times 4$ diam.).

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|--|--|
| 1. Smooth end of external canal opening into vestibule. The perilymph space contains inflammatory exudate. | 6. Tubal air cell. |
| 2. Stapedius: above this the tympanum contains pus. | 7. Carotid canal. |
| 3. Facial nerve. | 8. Cochlear nerve. |
| 4. Protonotary. | 9. Vestibular nerve. |
| 5. Tympanic membrane. | 10. Crus commune, with inflammatory exudate in peri- and endolymph spaces. |
| | 11. Smooth end of posterior canal. |



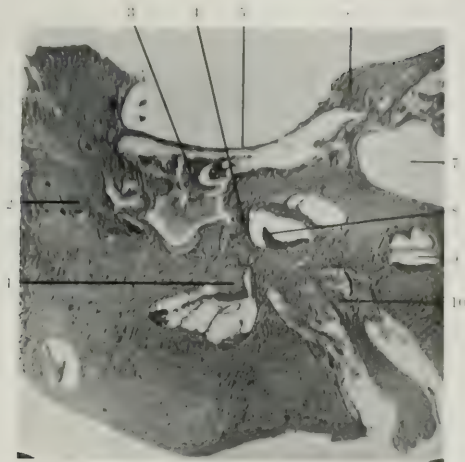


FIG. 7. -HORIZONTAL SECTION. (No. 267. $\times 4$ diam.).

- | | |
|--|---|
| <ol style="list-style-type: none"> 1. Inflammatory exudate in perilymph space at the point where the ampullary end of the posterior canal joins the utricle (sinus of posterior canal). 2. Facial nerve. 3. Pus in posterior part of tympanic cavity. 4. Membrane of round window. | <ol style="list-style-type: none"> 5. Drumhead. 6. Anterior part of tympanic ring. 7. Carotid canal. 8. Pus in scala tympani of basal coil. 9. Upper part of basal coil. 10. Pus among fibres of cochlear nerve in internal meatus. |
|--|---|

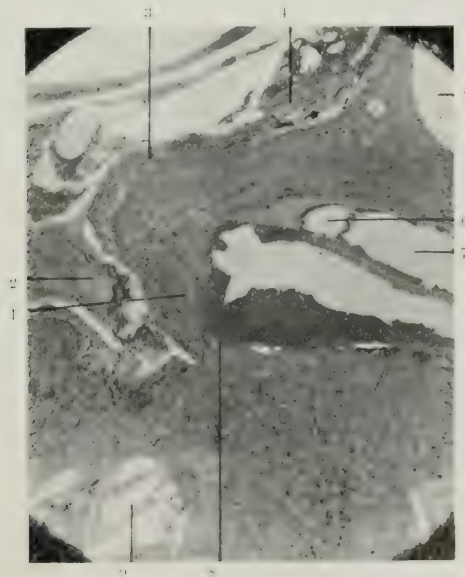


FIG. 8. -HORIZONTAL SECTION. (No. 279. $\times 10$ diam.).

- | | |
|--|--|
| <ol style="list-style-type: none"> 1. Swollen, enlarged, and infiltrated membrane of round window. 2. Pus and desquamated epithelium in niche of round window. 3. Swollen mucosa on promontory. 4. Nerve of tympanic plexus. | <ol style="list-style-type: none"> 5. Carotid canal. 6. Cochlear canal on scala media of basilar coil. 7. Scala vestibuli. 8. Pus in opening of perilymphatic space in scala tympani of basal coil. 9. Epineurial space of posterior canal. |
|--|--|

Microscopical Examination of the Left Ear:—

External auditory meatus normal.

Tympanic Membrane.—No perforation or myringitis; slight swelling of mucous membrane on inner surface.

Eustachian tube is wide and straight and almost free from pus, except in the lower part, *i.e.* the floor of the tube. There is very little pus in the anterior or tubal part of the tympanum.

Tympanic Cavity.—This contains pus but is not distended by purulent exudate, *i.e.* the drumhead is not bulged outwards. The tympanic mucosa is somewhat swollen, infiltrated with small cells and engorged. There is some muco-purulent exudate in the air cells in connection with the anterior part of the tympanic cavity. The mastoid antrum and its adjacent air cells also contain pus.

Ossicles.—The malleus, incus, and stapes are normal except for swelling of their mucous covering; there is a mass of pus in the hollow of the stapes.

Facial Nerve.—There is a hæmorrhage in the perineural space in the region of the geniculate ganglion, and the vessels along the facial nerve are much engorged.

Oval Window.—The footplate of the stapes is normal, but the annular ligament appears to be somewhat swollen and œdematous.

Round Window.—The secondary tympanic membrane is greatly thickened and slightly infiltrated. The niche of the round window contains purulent exudate.

Labyrinth Capsule and Surrounding Bony Tissue.—There is some hæmorrhage in the narrow spaces above and in front of the cochlea; otherwise the bony labyrinth capsule is normal. There are foetal rests of cartilage in the promontory just in front of the oval window.

Cochlea.—There is pus in the *scala vestibuli* and in the *scala tympani* in all coils. The cochlear duct is collapsed and Corti's organ disintegrated. In the middle coil the *scala vestibuli* contains a hæmorrhage. In the *scala tympani* of the basal coil the pus is very mixed, especially in the region of the round window where the opening of the *ductus perilymphaticus* is blocked by pus cells. The modiolus is also infiltrated by pus which has invaded the spiral canal and ganglion. The spiral canal also contains small hæmorrhages. There is more pus in the *scala tympani* of the cochlea than in the modiolus and spiral canal. The cochlea shows more pus than the vestibule.

Vestibule.—Pus and hæmorrhage are present in the perilymph space. Just internal to the footplate of the stapes there are masses of exudate, fibrin, and pus. The exudate in the vestibule is mainly in the anterior and outer part, *i.e.* external to and in front of the utricle, which is pressed on by the exudate. The neuro-epithelium of the utricle appears swollen and vacuolated. The postero-external wall of the saccule is ruptured and the cavity of the saccule contains

curdled lymph. The nerve to the sacculle is infiltrated with pus. There is a small hæmorrhage and some pus in the region of the ductus endolymphaticus as it begins within the vestibule.

Canals.—There is pus in the perilymph space of the external canal but none in the endolymph space; the crista is fairly well preserved. There is a hæmorrhage in the smooth end of the superior canal, while in the ampullary end the perilymph space contains pus and the endolymph space coagulated fibrin; the crista of this canal is disintegrated. In the crus commune the endolymphatic space contains only curdled lymph, and there is a similar condition present in the posterior canal. The ampulla of this latter canal is almost normal.

Internal Meatus.—Pus is present in the subarachnoid space and infiltrates the branches of the cochlear and vestibular nerve. The vestibular branches to the utricle and sacculle show pus cells, especially the latter. The vessels in the internal meatus are greatly dilated.

The saccus endolymphaticus shows no pus.

SUMMARY.—The purulent otitis media is not very advanced, and only the inner layer of the tympanic membrane is involved. There is no sign of involvement of the fibrous layer or of impending rupture of the drumhead. On the other hand, the niches of the oval and round windows show pus, and the membrane closing the round window especially is infiltrated. The labyrinth inflammation is also in an early stage, *i.e.* the serous stage is just passing into the purulent. The pus is most evident in the basal coil of the cochlea in the region of the round window, whereas the exudate in the vestibule on the inner side of the stapes is mainly fibrinous. Pus fills the cochlear opening of the perilymphatic duct and the cochlear canal itself is collapsed, as is usual in cases of leptomeningitis. The hæmorrhage in the narrow spaces surrounding the labyrinth capsule is probably a toxic change. The organism present—a capsulated gram-positive diplococcus showing a tendency to form chains—may have been the streptococcus mucosus capsulatus, an organism that frequently gives rise to labyrinthine and intracranial complications in cases in which it causes otitis media.

It is not easy to dogmatise as to the course of events in this case. Unfortunately we do not know the condition of the other (right) ear, nor of the nasal cavities. Further, we are ignorant as to whether the child had pneumococci in her blood before the meningitis developed. We cannot therefore be sure whether the subarachnoid space was infected through the blood-stream or from the nasal cavities, or even from the right ear. The appearances of the left (examined) ear would point to the conclusion that the infection passed from the tympanic cavity to the labyrinth, through the membrane closing the round window, and to a less extent through the annular ligament surrounding

the footplate of the stapes. From the basal coil of the cochlea the infection appears to have passed to the subarachnoid space along the fibres of the cochlear nerve, and also along the perilymphatic aqueduct. It must be admitted, however, that it is quite possible that the infection has gone the other way, *i.e.* that the scala tympani of the basal coil of the cochlea has been infected by pus passing up the perilymphatic aqueduct from the subarachnoid space, and that in the internal meatus the infection is passing along the perineural lymph sheaths towards the cochlea. From the microscopic examination of the ear there can be no doubt that the purulent labyrinthitis had not burst outwards, *i.e.* the tympanic cavity has not become infected from the labyrinth. Had the child recovered she would have been markedly or totally deaf in the left ear, and if the right ear had also been the seat of purulent labyrinthitis, she would almost certainly have been so deaf that she would not have learned to speak, *i.e.* she would have become an "acquired" deaf-mute. If such cases of labyrinthitis occur before the child learns to talk at all, they may be regarded in after life as cases of congenital deaf-mutism, as the parents do not understand the nature of the illness from which the child has suffered in infancy, and merely give a history that the child has never spoken.

(The writers are indebted to the Carnegie Trust for a grant covering the expenses of the microscopic work and the reproduction of the photomicrographs.)

A CASE OF SUBACUTE PURULENT OTITIS MEDIA, LABYRINTHITIS, AND PURULENT LEPTOMENINGITIS DUE TO A CAPSULATED STREPTOCOCCUS: SPONTANEOUS RECOVERY.

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and

J. L. OWEN,

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A. K., male, aged 32 years, fireman, suffered from pain and "noises" in the right ear in January 1915. In the end of February he had an attack which he describes as "influenza," during which the earache recurred, and was accompanied by headache, backache, vomiting, and epistaxis; one attack of vomiting lasted twelve hours. At this time the patient was in bed for nearly three weeks, but the right ear only began to discharge in the beginning of March. About the third week in March the pain in the ear and back had sufficiently abated to enable the patient to return to his work at the fire station, and he remained

at work until Friday, 26th March, when the pain in his ear and head recurred. On the following day the pain was worse, and the patient went to bed. On 28th March, about 4 A.M., he felt dizzy and vomited, and the pain in the ear and head became still more severe. In the evening he began to complain that the light was annoying him, and his friends state that he buried his head beneath the bed-clothes. He felt chilly at this time, and complained of pain in his right knee and in the back of the neck. The pain in his head also extended forwards over the top of the head, and at 8 P.M. he felt sick, but was afraid to vomit in case of increasing the headache. At 10 P.M. he vomited, and this was repeated several times till 4 A.M., when the vomiting stopped. The vomiting was accompanied by much retching. During the evening the patient complained of thirst, and about midnight his mental condition suddenly changed. He began to fling his arms about, try to get out of bed, kept putting his hands to his forehead, and also to his eyes and ears. He shouted a great deal, calling out his wife's name. He did not recognise those about him, and stared blankly at them. He was admitted to a medical ward on the 29th of March.

On admission the temperature was 102.4° F., the pulse 92, and the respirations 28. A leucocyte count showed 25,000 per c.cm. Lumbar puncture was performed, and purulent fluid under great tension was withdrawn. The report on this fluid was as follows:—"Cells are numerous and are chiefly polymorphs, with a fair number of lymphocytes and a few large mononuclear cells. In films made from the deposit no meningococci were found, but there were gram-positive diplococci of the pneumococcus type. These have not grown on culture after fifty hours."

Unfortunately a diagnosis of "epidemic cerebro-spinal meningitis" had been arrived at, and the case had been transferred to the Leith Public Health Hospital at East Pilton before the above report on the cerebro-spinal fluid was received. The error in diagnosis is easily understood when it is stated that just before the patient became severely ill on 28th March he had been visiting his mother-in-law, who was in a dangerous condition, and whose illness was ascertained to be "spotted fever." She died while the patient was in hospital at East Pilton.

Condition of patient on admission to East Pilton Hospital at 4.30 P.M. on 29th March.—The patient is delirious, with short intervals of semi-consciousness. He mutters and shouts angrily (always), sees and addresses imaginary friends, tosses his arms about, often putting them to his forehead and neck, avoids the light, but needs no restraint. Face is flushed and frowning, with the eyelids half closed. There is no retraction of head; in fact, the head is bent forward towards his chest and his back arched forwards. The muscles at the back of his neck are a little stiff, but the head can easily be moved, although with some pain. The muscles of his back are not stiff. Pupils are equal,

slightly dilated, and react sluggishly to light. Photophobia marked. Tongue furred and dry; lips dry, but no herpes. Throat is slightly inflamed; many bad teeth. Slight rigidity of abdominal wall. Skin moist; no sign of any rash on body. Kernig's sign present. Abdominal reflex present. The patient is well nourished, and the lungs and heart are normal.

On admission the patient passed urine in bed, but a specimen obtained later showed a trace of albumin. Lumbar puncture was performed, and yielded turbid fluid under pressure. Microscopic examination showed the same conditions as stated above.

30th March.—Patient seems quite conscious for a minute or two at long intervals; complains of pain in head; cries out sharply and suddenly. Temperature 100° F.

In the evening patient much quieter—sleeps at intervals. At times quite conscious but dazed; complains of pain in neck and in calves. The pain in head is more severe over the forehead. Vomits a good deal.

31st March.—Temperature normal; fairly comfortable; headache still severe; pain in right ear and over mastoid region. At night he slept a good deal and was much more comfortable. Photophobia still present; complains of dizziness and tendency to fall to right side (he was not sitting up, but said he felt as if he were falling to right side—side of ear trouble). Right ear discharging freely. Left ear is also painful. Spontaneous nystagmus present when eyes are turned to left.

1st April.—Headache less and confined to forehead, especially left part; no pain in neck. Left ear shows slight discharge; no pain. Right ear still discharging and painful. Giddiness still present, nystagmus also. Patient complains of seeing double. Patient improved continuously after this.

7th April.—Patient allowed to sit up in blankets. Kernig's sign absent; giddiness very marked; tendency to fall to right side; ears both dry.

10th April.—Patient allowed to get up. When he walks he leans towards his left. With eyes closed and feet together he sways towards his right.

13th April.—Discharged, and sent to Royal Infirmary, Edinburgh.

Examination at Ear and Throat Department, Royal Infirmary,

14th April.—The *right* tympanic membrane is red and bulging posteriorly. The postero-superior quadrant is especially bulging, but no pus is blown through on Valsalva's inflation. There is no mastoid tenderness. The *left* tympanic membrane is slightly indrawn and opaque, but there is no loss of gloss nor any sign of present inflammation.

Hearing Tests.—The watch is heard on the forehead and left mastoid,

but not on the right. The watch is heard at $\frac{20}{36}$ inches by the left ear, but is not heard even on contact by the right ear.

Bone conduction for the medium tuning-fork on the vertex is not lengthened. The vibration tuning-fork placed on the middle line of the vertex is heard in the better ear (left). On the left side air conduction is better than bone conduction (Rinne positive). On the right side the tuning-fork is not heard by air conduction, but is heard by bone conduction—probably in the good ear (Rinne infinite negative). The forks C_{32} , C_{64} , C_{128} , and C_{256} are all heard by air conduction by left ear but not by right. The forks C_{512} , C_{1024} , and C_{2048} are apparently heard by both ears, but better by left than by right. (These forks can be heard when both ears are closed with the fingers.)

Monochord.—The upper tone limit of the right ear was apparently 9000. With left ear closed with finger, the patient apparently hears the raised voice at 18 inches, but with the noise apparatus in left ear he is quite deaf.

Vestibular Apparatus.—No spontaneous nystagmus; no Rhombergism; no fistula symptom; spontaneous pointing normal.

Rotation Test.—Turning to right (10 times in 20 seconds) and stopping suddenly produces nystagmus to the left, which lasts 15 seconds. Turning to the left (10 times in 20 seconds) and stopping suddenly produces a lesser degree of nystagmus to the right, lasting 12 seconds. (*Note.*—The rotation tests tend to show that the right labyrinth is not functioning.)

Caloric Test.—Syringing right ear with cold lotion for three minutes produced absolutely no nystagmus. Syringing left ear with cold lotion produced horizontal and rotary nystagmus to the right in about 3.5 seconds, with marked giddiness, and with the typical pointing error to the left, and tendency to fall to the left when patient stood with feet together and eyes shut.

(*Summary of Functional Examination of the Ear.*—Complete loss of vestibular function on right side; possibly a little hearing power still remains, but even this is uncertain.)

14th May.—Patient reports after being in the country for a month. He feels well. The right ear is quite dry, but quite deaf. With the noise apparatus in the left ear the patient hears nothing. There is no spontaneous nystagmus. No Rhombergism, and patient can walk in a straight line with his eyes shut. Rotation to right and also rotation to left both produce nystagmus of only about 12 seconds' duration (compensation phenomenon). Patient is to start easy work on Monday.

5th June.—Condition quite satisfactory.

REMARKS.—The patient had a mild attack of otitis media without otorrhoea in January 1915. The trouble recurred in February, and at this time appears to have been accompanied by labyrinthine or intra-

cranial irritation, as evidenced by the headache and vomiting. Again, there does not seem to have been any discharge from the ear at this time. Otorrhoea only commenced in the beginning of March. After three weeks in bed the patient resumed his work about the 20th of March, but after he had been only one week at work he became very ill with symptoms of purulent labyrinthitis, rapidly passing on to leptomeningitis. We know that extreme care and quiet are necessary in cases of latent labyrinthitis, if purulent leptomeningitis is to be avoided. Such cases are going about with a "powder magazine in their heads." In the present case the rapid subsidence of the meningitis is remarkable, the stage of delirium followed by semi-coma only lasting for 48 hours. As is usual in such cases as the present, the patient made a complete recovery as far as balancing is concerned, *i.e.* the loss of one vestibular apparatus is compensated for by the healthy side taking on the function. The loss of one vestibular apparatus is not noticed by the patient, but the unilateral deafness is a source of inconvenience. The case demonstrates the importance of microscopic examination of a film made from the deposit from the cerebro-spinal fluid in a case of meningitis. The fact that the patient had been visiting his mother-in-law, and that she was known to be suffering from "spotted fever," made the diagnosis of epidemic meningitis a natural, though hardly a correct, one. The case further shows that purulent otitic meningitis may be recovered from without operation.

(The writers are indebted to Dr. Robertson, Medical Officer of Health for Leith, and to Dr. Logan Turner for permission to record the above case.)

A CASE OF MYXŒDEMA, WITH TETANY AND SUPRARENAL INSUFFICIENCY.

By JOHN EASON, M.D.

THE case described below presents some unusual features of considerable interest in relation to the functions of the ductless glands. The main points may be summarised as follows:—

1. Myxœdema undergoing the customary improvement on thyroid.
2. Some clinical evidences of suprarenal inadequacy, with improvement after administration of adrenalin.
3. Slight fibrosis of one suprarenal gland.
4. Symptoms bearing a resemblance to both tetany and paralysis agitans, diseases which have been ascribed to parathyroid changes.
5. In one parathyroid there were appearances suggesting great secretory activity. There were no evidences of parathyroid disease.
6. The ultimate failure of thyroid medication.

Mrs. B., aged 37, was admitted to hospital on 24th June 1910. She stated she had been well until the birth of her last child 2 years and 9 months ago. She then observed that her skin became darker in colour, drier, and more scaly than formerly, although it was always rather dry. The dryness and scali-

ness were specially marked on the knees. She says she cannot swallow, and she is somewhat hysterical. She does not remember how long she has had this symptom, and it is referred to in obviously exaggerated terms. Social conditions and habits satisfactory.

Family history has no evident bearing on her illness. She has two healthy children.

Personal history is that she had scarlet fever and measles when young. Menstrual history was not obtained.

Present Illness.—Onset indefinite in manner and uncertain as to date.

STATE ON EXAMINATION.—Skin of hands is thick, tough, hard, and wrinkled; it is very dry, fissured, and desquamating, and is unusually yellow in colour. The hair on the back of the hands and fingers is rather more profuse than usual with females. It is well marked on the second phalanges. The hand is thick and clumsy, heavy, and horny. The fingers tend to taper towards the points. On the arms the skin is also coarse, thick, and scaly, and yellowish in colour. The skin of the face has a decided bronze-yellow tint, is scaly, and parchment-like. These characters are well marked on the forehead and around the eyes.

The scalp hair is dark brown, thick-set, long, and is coarse in texture. There is some hypertrichosis of the chin and upper lip. The eyebrows are well marked.

The skin of the chest and abdomen has some old scars, and it is dry and coarse. Linea nigra is well marked. Pubic hair normal. There is no hypertrichosis of the skin of the trunk.

The skin of the legs and feet is hard and dry, and there is desquamation of the dorsal aspects of the feet. Mild ichthyosis pilaris is present on the legs. On the knees the skin is extremely thick, hard, dry, fissured, and black. Around the ankles there are the same appearances in a milder degree. There is hypertrichosis of the legs and the dorsal aspects of the toes and sides of the ankles. Ichthyosis and hypertrichosis and increased pigmentation are thus more or less general and well marked.

The soles of the feet and palms of the hands are soft and moist, but the skin is thick.

Circulatory System.—Pulse, 80; tension is low (see records); arterial coats are slightly thickened, but there is no tortuosity. This system and the *respiratory system* appeared to be normal to clinical examination.

Nervous System.—Sleep is very unsatisfactory. She talks much during sleep, and wakes up frequently. She suffers from delusions and hallucinations.

Hæmopoietic System.—Red blood corpuscles, 4,000,000; Hb., 75 per cent.; white blood corpuscles, 11,000; polymorphs, 61 per cent.; large mononuclears, 2 per cent.; eosinophils, 1·2 per cent.; small lymphocytes, 24·5 per cent.; transitionals, 1·3 per cent.

The *urine* contained no sugar or albumin. Indican was present.

Ductless Glands.—Thyroid gland appears to be small. Examination made suggests pituitary is normal. The cutaneous pigmentation and low vascular pressure suggest suprarenal inadequacy. No thymus symptoms.

Blood-pressure records are as follows:—

July 1st.	3rd.	4th.	6th.	10th.*	12th.	18th.	24th.	26th.	27th.†	29th.	31st.
124	117	117	115	114	95	95	100	98	98	117	112
		August 2nd.	4th.	12th.	13th.	15th.	18th.				
		102	104	95	98	95	98				

* Thyroid administration began. After losing 1 lb. she steadily put on weight, and in three months gained 1 stone.

† Adrenalin suppository given.

The patient was discharged in September very much improved, mentally normal, and much better in appearance and strength. The ichthyosis, pigmentation, and dryness of skin were also much improved. She was strong enough to look after her house. She was told to take one 5-gr. thyroid tabloid weekly. She, however, gradually became weaker, although mentally quite competent. The thyroid was increased to two tabloids weekly. This was not followed by improvement, but she continued to take thyroid. In December she had pain in the abdomen, which was diagnosed by her doctor as due to an attack of appendicitis. During January, February, and March she was scarcely able to do any work, and during the last half of March and the first week of April she fell several times. A week before readmission she was confined to bed, and four days later there were signs of mental confusion and loss of memory. Through all this period she continued taking thyroid tabloids.

Readmitted on 10th April 1911, unable to walk, unable to take solid food, and complaining of a "strange worrying sound across the stomach."

Many of the above details were obtained from the husband as the patient's memory was very poor. Her own words were, "I can't hear or remember anything."

STATE ON EXAMINATION.—The skin and hair were much as when she first came under observation. The malar region was flushed. It was noted that she had bow legs.

As before, it was observed that the palms of the hands perspire rather freely. The hands are cold and clammy. Expression vacant. Temperature, 99.6°; pulse, 86; respiration, 32. Thyroid isthmus, but not the lateral lobes, palpable. Lymphatic glands not enlarged.

Red blood corpuscles, 5,228,000; Hb., 75 per cent.; white blood corpuscles, 10,400; polymorphs, 66.6 per cent.; lymphocytes, 29 per cent.; large mononuclears, 4 per cent.; eosinophils, 0.5 per cent.; mast cells, 0 per cent.; transitionals, 0.75 per cent.

Nervous System.—I. *Intellectual Functions.*—Right-handed. Memory for recent events defective, memory for past events, which took place six months or more ago, fairly good. Has not slept well lately. No bad dreams. No hallucinations.

She imagines that she cannot hear or remember anything, but there is no defect of hearing, and on being pressed she often remembers. Speech is slow and halting. She is very emotional.

II. *Cranial Nerves.*—1st Nerve.—Functions unimpaired, though she imagines she has lost the sense of smell.

2nd Nerve.—Acuity of vision, extent of field of vision and colour sense unimpaired. Fundi normal. No nystagmus. Pupils unequal, right larger than left. They both react to light and convergence, but the right more slowly than the left. Over the cornea of the right eye there is the scar of a healed corneal ulcer.

III. *Motor Functions.*—She asserts that she is unable to walk. When got out of bed on her feet she allows herself to slip to the floor. With a little support, however, she can be induced to walk slowly and stiffly. The strength of the muscles of both the arms and legs is not below the average. Co-ordination is unimpaired. There are no abnormal movements. There is no muscular wasting.

IV. *Sensory Functions.*—No defect found in a rough examination, but the patient's mental condition does not allow of accurate testing.

Reflexes.—The deep reflexes are easily obtained and brisk. The superficial reflexes are on the whole diminished.

Urinary System.—Urine acid. No albumin, blood, bile, sugar, or pus.

Genital System.—No history obtainable. There was a blood-stained uterine discharge on the 11th and 12th of April.

Circulatory System.—Apex beat in 5th interspace. Sounds are somewhat faint. Pulse regular; moderate amount of expansion; no thickening of vessel wall; pressure, 100.

Respiratory System.—Nothing to note.

Progress Notes.—On the night after her admission she slept only one hour. She seemed rather excited and anxious, but did not complain of anything definite. During the next two days she was quiet and rather apathetic. Her memory for recent events was rather more defective than on admission. She did not sleep well.

On the next day, the 13th of April, she was definitely more lethargic and indifferent. She complained of abdominal pain and had retention of urine. Twenty ounces were withdrawn by catheter. She slept well that night after getting chloral and bromide.

On the 14th she was dazed and stuporose. It was impossible to get her to move voluntarily. When she was put on her feet she remained rigid, and would have fallen if not supported. The catheter had again to be passed. There was incontinence of feces.

During the next few days the stuporose condition persisted, but tremor, slow and coarse, of the hands and lips and tongue were observed. The arms were held stiffly, flexed at the elbow at rather more than a right angle. The fingers were flexed at the metacarpo-phalangeal joints, extended at the interphalangeal joints, and there were occasionally involuntary slight movements of pronation and supination of the forearms. There were also "pill-rolling" movements of the thumbs on the forefingers. The fingers were bunched together in the position seen in tetany and in paralysis agitans.

All the muscles were stiff and rigid. The deep reflexes were markedly exaggerated, much more so than on admission. The retention of urine persisted.

On the 17th the retention of urine ceased, and she now had incontinence both of urine and feces.

On the 18th blood and a considerable amount of pus was found in the urine.

On the 19th she twice had clonic convulsions, which consisted in an exaggeration of the movements already described.

It was found that these involuntary movements were increased on making firm pressure round the arm.

On the 20th her pulse was very weak, and at times difficult to feel. The blood pressure was low. She was unable to swallow. The temperature had risen to 100°. There was continual dribbling of urine from an empty bladder, and incontinence of feces. There were several areas of reddened skin on her back on which blisters developed. These were not all on pressure points.

On the 21st there was no change, except that the temperature rose further and the frequency of the pulse reached 120 at night.

On the 22nd she died in the forenoon. The rigidity was marked at the time of death, and there was head retraction and some opisthotonos. Cerebral and spinal fluid removed immediately (5 minutes) after death contained no cells.

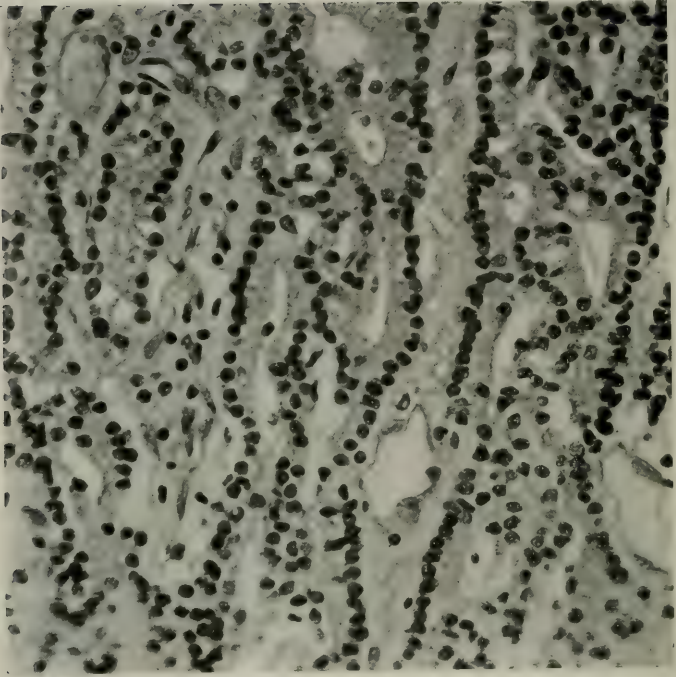


FIG. 1.—Left Superior Parathyroid. High Power. For description *vide* text.

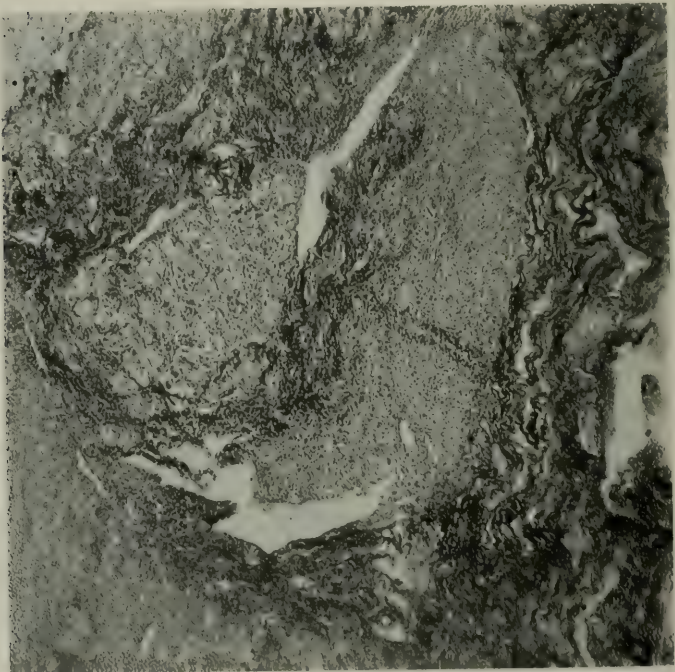


FIG. 2.—Thyroid. Low Power. Complete Absence of Acina Structure; Great Reduction of Parenchyma and Increase of Fibrous Tissue.

1 c.mm. There were no convulsions at the time of death. No blood in the motions with benzidin, guaiac, and aloin tests.

Blood-pressure,	April 12th.	13th.	14th.	19th.
	100	118	95	105

Treatment.—During the first five days in hospital after her readmission she had no thyroid, but from the sixth day until her death on the twelfth day, $2\frac{1}{2}$ grs. of thyroid tablet were given thrice daily. At this date (1911) no reliable preparation of parathyroid was available.

Diagnosis.—The diagnosis made was myxœdema, complicated by suprarenal insufficiency, and possibly (according to prevailing theories) parathyroid insufficiency.

On post-mortem examination the following changes were found :—

Parathyroids.—1. *Left inferior* fairly large, stains well with picrofuchsin and hæmatoxylin; moderate amount of fat; cell structure normal; no colloid.

2. *Left Superior.*—Larger than preceding; very vascular. In one part the cells are columnar, with basal nuclei staining deeply, giving the impression of a very active acinar gland, the structure being entirely different from the usual post-mortem appearances, but interspersed among this abnormal (?) tissue there are small areas of apparently normal gland structure. No colloid tissue present (Fig. 1).

3. *Right superior* (?) *inferior* bears more resemblance to (1) than to (2), but contains more fat than either; in a very few places the acinar arrangement is met with. No colloid seen. Fourth parathyroid could not be found.

Thyroid is small and firm, and shows no trace of normal structure. It contains enormous quantities of lymphoid and fibrous tissue, very little colloid, and a few very large irregular cells scattered here and there (Fig. 2).

Thymus consists chiefly of fat, but one or two Hassal's corpuscles and small aggregations of lymphoid tissue were found.

Suprarenals.—Medulla very small and closely packed with lymphocytes. Cortex considerable; fat in *zona fasciculata*, absent elsewhere. One suprarenal showed slight fibrosis of both cortex and medulla.

Pituitary, spleen, bone-marrow, and ovaries showed no changes of any importance.

Kidneys.—There was complete absence of any inflammatory changes to the naked eye, and the microscopic examination revealed nothing abnormal. The organs were hyperæmic.

The other organs of the body were healthy.

The facts of the above case are especially interesting when considered in conjunction with the statements of some observers who have devoted themselves to the study of myxœdema.

Vincent and Jolly, who were unable to produce anything resembling myxœdema by simple thyroidectomy in animals, believe that the pathology of the disease is complex, and that it cannot be explained by thyroid insufficiency alone. In a fatal case of myxœdema Forsyth has shown that not only the thyroid, but also all the parathyroids, were abnormal. In this case there were indications that the parathyroids were attempting to compensate for the loss of thyroid function.

Brissaud's hypothesis is that in cases of myxœdema accompanied by mental trouble the parathyroids are involved, whilst in cases devoid of mental symptoms the thyroid alone is affected.

RECENT ADVANCES IN MEDICAL SCIENCE.

MEDICINE.

UNDER THE CHARGE OF

W. T. RITCHIE, M.D., EDWIN MATTHEW, M.D., J. D. COMRIE,
M.D., AND A. GOODALL, M.D.

A NEW THEORY OF THE CAUSATION OF ENTEROSTASIS.

IN his Cavendish lecture Keith (*West London Med. Journ.*, July 1915) adds a valuable contribution to the difficult subject of intestinal stasis. It has been shown by means of X-rays that food is normally delayed at certain points of the alimentary canal—there is delay at the junction of the œsophagus and the stomach, a greater delay at the pylorus: there is evidence for the existence of a regulating mechanism near the duodeno-jejunal junction; there is certainly a mechanism at the lower end of the ileum which regulates and retards the passage of contents from the small to the large intestines. Along the large intestine there appear to be three points at which delay may be regarded as normal. These are (1) near the commencement of the transverse colon, leading to the filling of the cæcum and ascending colon; (2) at the recto-colic junction, leading to accumulation in the pelvic colon; (3) above the anal canal, leading to accumulation in the rectum. The degree of delay at these points differs among individuals, but there are cases in which the delay is so great at one or more points that it must be regarded as pathological.

An experimental and histological research has demonstrated that Auerbach's plexus is not a simple nerve plexus but that it contains ganglion cells with fine processes which are connected with intermediate branched cells. These intermediate cells may resemble either nerve or muscle, and they are in turn connected with the muscle cells of the intestinal wall. This plexus represents in the intestine a system which corresponds to the nodal and conducting system of the heart. Experimental evidence was obtained that pyloric movements are a direct result of initial cardiac contractions, and it is held that there exists at the gastro-œsophageal junction a main nodal centre at which the rhythmical contractions of the stomach are initiated.

There is probably a centre for the duodenum at a point proximal to the common bile duct. These suggestions receive striking confirmation from observations made on the behaviour of excised pieces of bowel. The contraction rhythm varies according to the presence and amount of nodal tissue in its wall. There is no structural differentiation of a sphincter in the terminal part of the duodenum, but duodenal

stasis and dilatation is not an infrequent condition. It is not due to a kinking at the duodeno-jejunal junction, for all radiograms show that the blockage is near the junction of the second with the third part of the duodenum, where there is neither a sphincter nor an arrangement of parts which could produce a mechanical obstruction.

In ileal stasis there is some obstructive force in the neighbourhood of the ileo-caecal junction delaying the passages of the iliac contents. There is no sphincter comparable to the pyloric sphincter, but there is in the terminal part of the ileum an elaborately organised sphincter mechanism, and there are also peritoneal bands and folds both of embryonic and post-embryonic origin. It is conceivable that the sphincter mechanism might become disordered or that, in the upright position of the body, the peritoneal bands might produce a mechanical obstruction. In either case ileal stasis would result.

An examination of X-ray plates from cases of ileal stasis showed a number in which the bismuth shadow in the terminal part of the ileum was reduced to a thread or was absent, as if there had been a spastic condition of the terminal ileal sphincteric tract, but no single radiogram showed a sharply marked obliteration of the terminal ileum such as might be caused by the constricting or dragging action of a peritoneal band or adherent appendix. In the majority of cases of ileal stasis there is neither evidence of a spastic sphincter nor of an obstructing band. There is some other factor at work. Stasis of the proximal colon may be explained by an appeal to mechanical means or to a functional derangement of the colic musculature, or to a combination of both factors.

Radiograms have failed to produce evidence of obstruction situated at kinks or bands; there is no hypertrophy of the muscular coats above the site of such kinks or bands. When acute flexures of the bowel are produced experimentally, stasis does not result. On the other hand, evidence is fairly complete which points to a gross derangement of the action of the musculature of the transverse, descending, and iliac colons in cases of stasis of the great bowel. In many cases of constipation there is a marked increase of tonus in these segments of the colon. Neither mechanical conditions nor derangements of sphincter mechanisms can give an adequate explanation of all the phenomena of enterostasis. But when we transfer from the heart to the alimentary canal not only the anatomical and physiological data relating to its nodal and conducting system, but also our knowledge of cardiac pathology, of heart-block, fibrillation, delayed conductivity, etc., we seem to reach a more rational explanation of the motor derangements of the alimentary canal. All non-striped muscle has the power of rhythmical contraction, which it continues to exercise as long as it is alive. At least four rhythmical zones in the intestine are distinguished—a duodenal, a jejuno-iliac, a proximal colic, and a distal colic.

There are grounds for presuming two more—a gastric and œsophageal. Between the rhythmic zones there are sphincters which may arrest the passage of contraction waves, the muscle being contracted and in an almost continuous refractory period. All sorts of blocks are thus possible, and a close co-ordination of reflexes may lead to disturbed rhythm of all the segments as the result of impairment of one.

This hypothesis brings into the foreground the musculature of the alimentary canal, which is the sole propelling power. It is in harmony with clinical and pathological findings, and rests on a better basis of anatomical and physiological fact than the theory of drag, band, and kink.

INFLUENCE OF AGE AND SEX ON HÆMOGLOBIN.

Williamson (*Journ. Amer. Med. Assoc.*, 24th July 1915) records a careful spectrophotometric analysis of 919 cases. Hæmoglobin value is greatest at birth. A decline begins at once, so that by the fifth month the average value is nearly down to the minimum and is far below the average adult figure. The diminution continues at a much slower rate, and the minimum is reached in the second year. A rise then follows and continues till the sixteenth year, and thereafter the variations in the different periods are small. The fall in the first five months is not due to artificial feeding or malnutrition. The values up to the fifteenth year are almost precisely the same for both sexes. From the sixteenth to the seventeenth year the sex differences are plainly manifest. From the fiftieth to the seventieth year the difference between the sexes still exists, although to a somewhat less degree than during the period of child-bearing. From sixteen to sixty the hæmoglobin value of the female averages 91·7 per cent. of the males. From sixty-one to seventy the females have 95·6 per cent. Over seventy-one the sex values are practically identical. From these observations it is concluded that no instrument which is graduated in percentages of a supposed average normal individual can be utilised for making determinations at different ages without correction. In order to make the comparison of results possible it is imperative to use an instrument which reads in absolute terms, *i.e.* which expresses its results in grams of hæmoglobin per 100 c.c. of blood. For ordinary clinical purposes it is unnecessary to use so delicate an instrument as the spectrophotometer. Most of the better class of instruments will be fairly satisfactory as regards their ability to detect variations of sufficient amount to be clinically important. Their unsatisfactory character lies in the fact that the basis of standardisation is an unsatisfactory one, since there is no such thing as a perfectly normal individual with a particular concentration of blood to which the concentration of all normal blood at all ages should conform. Whatever hæmoglobinometer is used it should read in absolute terms,

and clinicians must accustom themselves to the variations in haemoglobin at different ages, and to the allowance for sex at certain periods.

IMMEDIATE RESULTS OF SPLENECTOMY IN PERNICIOUS ANÆMIA.

Some months ago the writer (Gulland and Goodall, *The Blood*, 2nd edition) had occasion to review the literature on this subject.

The argument for the operation is based upon the good results obtained by splenectomy in Banti's disease, the suggestion that in pernicious anæmia there is a pathological exaltation of the function of the spleen in dealing with old and effete blood corpuscles, and a theory that the spleen may produce a hormone which inhibits the action of the bone-marrow. It was pointed out that there is no similarity between Banti's disease and pernicious anæmia. It is admitted that the spleen takes up old corpuscles, but it is doubtful whether a prolonged sojourn of these old corpuscles in the circulation would be of much benefit to their host. The suggested inhibitory influence of the spleen on the marrow is not proved and, in view of experimental research, unlikely. We have found the spleen to be a seat of supplementary blood-formation in pernicious anæmia. The capricious course of the disease makes any conclusion as to curative measures particularly difficult, and we were not prepared to admit any benefit greater than that obtained by simpler and safer means.

Lee, Vincent, and Robertson (*Journ. Amer. Med. Assoc.*, 17th July 1915) report five cases from Cabot's service in Massachusetts General Hospital.

I. Male, 43, six attacks in two and a half years. During the fourth attack corpuscles had fallen to 850,000 per c.mm. In the sixth attack the red corpuscles numbered 2,525,000; leucocytes, 5000. Splenectomy was performed. Next day the leucocytes numbered 26,400, but gradually fell in number. On the second day there was a large accession of nucleated red cells and Jolly bodies. Three and a half months later the count was 5,028,000, but the average size was still increased and several corpuscles showed Jolly bodies.

II. Male, 54, third attack in three years. Red corpuscles, 736,000; Hb. 15 per cent.; leucocytes, 3000. Spleen palpable. After transfusion corpuscles rose to 3,000,000. After splenectomy there was a stormy convalescence, with considerable variations in the counts. When last observed red corpuscles numbered 3,968,000 per c.mm.

III. Male, 31, fourth attack. Corpuscles, 1,422,000, rising to 1,920,000 after transfusion. After splenectomy, 4,112,000.

IV. Male, 43, first attack, twenty months' duration. Reds, 1,628,000. Splenectomy, reds rising to 4,824,000.

V. Male, 44, second attack. Corpuscles, 2,000,000. Splenectomy effected no great improvement. In all cases after splenectomy there

was a marked transient leucocytosis, a shower of nucleated red cells, and the appearance of Jolly bodies. The counts showed little improvement for three weeks, but by the fourth week there was a rise. There was a diminution of faecal urobilin. In spite of improvement the blood retains the characteristics of pernicious anæmia, except that the colour index tends to become low. The authors conclude that splenectomy is not a very serious operation in pernicious anæmia, and it offers a definite means of inducing a remission. The remission thus brought about is more marked in the majority of the cases than by any other known therapeutic procedure. A. G.

SURGERY.

UNDER THE CHARGE OF

J. W. STRUTHERS, F.R.C.S., AND D. P. D. WILKIE, F.R.C.S.

GASTRIC CARCINOMA.

FRANK SMITHIES (*Amer. Journ. of Surg.*, July 1915) contributes an article on the early diagnosis of gastric carcinoma, and makes a brief clinical study of 921 cases recorded by him in the Mayo Clinique and at the Augustana Hospital.

Facts derived from *clinical histories*: Gastric carcinoma was found to be three times more common in males than in females. It is observed that this relative frequency of carcinoma in the sexes corresponds closely to that of chronic peptic ulcer. The age incidence reached a maximum in females during the fifth decade and in males during the sixth decade.

The clinical histories were grouped under various symptom-complex heads. Of those presenting a history suggestive of simple gastric ulcer there were 7·8 per cent., and in these cancer was only diagnosed by microscopic examination. The edge and base of the ulcer showed evidence of early carcinoma in the form of epithelial wandering through basement membrane. Gastric carcinoma which had developed in individuals with long-standing symptoms of peptic ulcer occurred in 47·3 per cent. Only in 31·9 per cent. of the cases were there no gastric symptoms prior to the onset of malignant disease. The remaining cases presented histories of no definite clinical type.

With regard to hæmorrhage, importance is laid on the value of chemical tests for occult blood in the stools after a meat-free diet. If there be a history of peptic ulcer, persistent demonstration of altered blood in the stools is considered a fair indication that malignancy is highly probable, and, according to the author, constitutes an early and valuable diagnostic sign.

Vomiting often occurs early in malignant disease when there is stenosis resulting from a chronic peptic ulcer. The onset of inter-

mittent or persistent vomiting, particularly if it is associated with a history of ulcer dyspepsia in a patient at the cancerous age, should indicate prompt surgical interference. Such measures frequently lead to the actual demonstration of early cancer and permit of its complete extirpation.

Facts determined by *physical examination*: Two-thirds of the tumours occurred in the pyloric region, the antrum, and the pyloric half of the lesser curvature. In 12 per cent. the greater curvature was invaded. In 9.3 per cent. the growth was situated in the posterior wall, and in 2.3 per cent. on the anterior wall. The cardia was affected in 3.5 per cent. Fully one-third of the growths were not palpable, and these included the majority of the operable cancers. The size of the tumour varied greatly. *Ulcer carcinoma* could be felt only as narrow finger-like ridges or as small nodules. Primary gastric carcinomata on palpation ranged from the size of a marble to a mass the size of a child's head. Abdominal tenderness was found to be relatively more marked in *ulcer carcinoma*.

Loss of weight in primary gastric carcinoma was, as a rule, constant and more rapid than in ulcer cancer. In the latter condition there sometimes occurred slight losses, followed by definite gain over long periods, but eventually the drop was steadily maintained and its rate accelerated. Persistent loss of weight in an individual over 40 years of age who has been a chronic dyspeptic or who has recently become affected with constant gastric trouble demands that gastric malignancy be excluded before any other diagnosis can be seriously considered. Cachexia is a late manifestation, and usually indicates that the condition is beyond radical cure.

Facts determined by *laboratory methods*: Persistent interference with the free emptying power of the stomach is considered a sign of great worth in the early diagnosis of carcinoma. A meal consisting of a liberal allowance of ordinary food should be used as a test.

The quantitative variations in free HCl were found to be of greater value prognostically than diagnostically. In inoperable carcinoma with marked ulceration the average free HCl was 2.4, and in carcinoma without gross ulceration 6.4. In ulcer cancer the average HCl was 31, and the total acidity 48. These figures closely resemble those obtained in simple chronic peptic ulcer. Nevertheless, the progressive lowering of free HCl and a corresponding increase in the combined HCl, especially if associated with permanent interference with the gastric emptying power and persistence of altered blood in the properly prepared stools, indicate a laparotomy on the suspicion that malignancy is present.

Lactic acid means gastric stagnation with diminished free HCl. Its demonstration in test-meal specimens was associated, in nine cases out of ten, with hopeless malignancy.

Various tests, such as the formol index, the edestin, glycyltryptophan, and the Wolff-Junghan's tests, are mentioned and figures given. They were found to be of little clinical value.

An abundance of Boas-Oppler bacilli in 80 per cent. of cases was associated with inoperable carcinoma. The demonstration of the bacilli is considered to be of prognostic value, as they are rarely to be found in curable cases.

Facts obtained by *Röntgen examination*: In well-established carcinoma there may be demonstrable deformity in the stomach outline, alterations in gastric peristalsis and emptying power, variations in stomach size, abnormal position of the viscus or fixation to adjacent organs. In the differentiation between gastric and extra-gastric malignant disease and also in physically inaccessible growths, as those at the cardia and fundus, Röntgen examination may give valuable information. Since the majority of chronic callous ulcers of the stomach, more than 1 cm. in diameter, have been found to be malignant on microscopic examination, the Röntgen demonstration of an ulcer of this type should lead to a suspicion of malignancy and suggest an abdominal exploration.

TUMOURS OF THE BLADDER.

B. A. Thomas (*Surg., Gynec., and Obstet.*, August 1915) gives an account of the technique of operations for vesical tumours. Brief mention is made of the various growths encountered, and also of the close relation existing between papilloma and cancer. In many papilloma carcinomatous degeneration can be microscopically demonstrated in the projecting surfaces, and in these cases, sooner or later, the pedicle likewise becomes involved, and then the only hope of cure is by resection of the bladder. The routine practice of removing, per urethram, sections of tumours for microscopical diagnosis prior to surgical intervention is deprecated. In doubtful cases the diagnosis can be readily decided by a few high-frequency applications, without incurring the risks of implantation of tumour cells.

The choice of treatment in any given case is dependent upon many factors, the chief of which are—(a) the general condition of the patient; (b) the extent of the disease, often manifested by infiltration and induration about the base of the bladder on rectal and vaginal examination; (c) the cystoscopic revelations as to number, size, character, and location of tumours.

Non-incisional Forms of Treatment.—Of these, *high-frequency electrocoagulation* is considered to be pre-eminent, especially for papillomata. The author has never seen a case of true papilloma, whether single or multiple, that was not effectively destroyed by this method. The application should not be painful, and a general anaesthetic is not

necessary. The treatment should be given not oftener than twice weekly.

The use of *radium* has yielded poor results, due probably to insufficient quantities having been employed. It should only be used for inoperable malignant growths or as a post-operative prophylactic against recurrence. In extensive tumours it is best applied through a suprapubic vesical opening.

In view of the great success of the high-frequency treatment, per urethram excision, snare strangulation, and cauterisation are now considered to be obsolete.

Incisional Forms of Treatment.—The radical treatment of vesical carcinoma is regarded as one of the most difficult in surgery, partly on account of the inaccessibility of the majority of the tumours, and partly on account of the difficulty in dealing with the ureters. The operation may be either a partial or total cystectomy. In spite of the high mortality (10 to 20 per cent. for partial and 45 to 60 per cent. for total cystectomy) the author advocates a more frequent resort to radical measures.

Partial cystectomy may be performed intra-peritoneally or extra-peritoneally. The former method affords an opportunity of examining the peritoneum, lymphatics, and abdominal viscera for metastases. Moreover, the mortality following the intra-peritoneal route is less than half that following the extra-peritoneal resection. For these and other stated reasons the author strongly favours surgical attacks on the bladder through the peritoneal cavity. The wall of the bladder affected is completely removed, and the edges, after being cauterised or swabbed with a solution of resorcin, are united by running mattress sutures, and made secure by Lembert sutures. Should the ureteral orifice be involved, it is sacrificed and the terminal end of the ureter reimplanted through a stab wound in healthy vesical tissue. Half or even two-thirds of the bladder may be successfully excised. Unless there is evidence of marked cystitis or the ureter has been transplanted it is unnecessary to drain either the peritoneal cavity or the bladder. The patients are usually able to void small quantities of urine frequently, and are more comfortable without than with a catheter.

Total cystectomy is a grave procedure, but is less so if performed in two stages. The first operation should be restricted to a satisfactory deviation of the urine. In the female the ureters may be implanted into the vagina by Pawlik's method. Maydl's operation is rarely possible in bladder tumours. Transplantation of the ureters into the rectum, colon, and appendix has usually led to ascending infection, and is not considered a justifiable procedure. Likewise after transplantation to the loins and suprapubic regions, renal infection frequently supervenes. The author strongly favours Watson's suggestion of performing preliminary bilateral nephrostomies.

The removal of the bladder may be done either extra-peritoneally or intra-peritoneally. In those cases requiring removal of the prostate, prostatic urethra, and internal vesical sphincter, it is advisable, as a preliminary step, to free the prostate and vesical neck and sever the membranous urethra through a perineal incision, similar to that in the operation of radical prostatectomy for carcinoma.

Palliative Operative Treatment.—In incurable cases suprapubic cystostomy may become necessary for the removal of clots, to stop hæmorrhage, to relieve pain, and to permit of urinary drainage. The bladder incision should be made well up toward the fundus and the vesical wall should be sutured to the skin. With the object of prolonging life a cystostomy may be performed, as much as possible of the tumour excised, and radium applied.

Reference is made to exclusion of the bladder as a palliative operation. Most surgeons are of the opinion that the risk of ascending infection after transplantation of the ureters is too great to justify such a procedure in inoperable malignant cases. The author, however, thinks it probable, in view of lesser likelihood of renal infection and improvements in the construction of kidney drainage apparatus, that the future will see more nephrostomies performed.

The importance of repeated cystoscopic examination after operation for benign tumours and after radical excision of malignant growths is strongly emphasised.

J. N. J. H.

OBSTETRICS AND GYNECOLOGY.

UNDER THE CHARGE OF

A. H. F. BARBOUR, M.D., AND J. W. BALLANTYNE, M.D.

INFLAMMATORY AFFECTIONS OF THE UTERINE ANNEXA IN PREGNANCY.

DR. E. FERRONI (*Ann. di ostet. e ginec.*, 1915, ann. xxxvii. vol. i. p. 157) deals with cases of pregnancy complicated by the presence of inflammatory lesions of the ovaries and Fallopian tubes, and he limits his inquiry to twenty cases under his own observation in which the inflammatory affection of the tubes and ovaries was actually existing during the course of the gestation. He subdivides these twenty cases into two groups, in one of which (comprising 12 cases) the morbid states (oophoro-salpingitis and peri-oophoro-salpingitis, with or without pelvic peritonitis) were tending to disappear or had already accomplished part of their retrogression when conception took place; in the other group (containing 8 cases) the annexial lesions were active, their activity, however, varying in intensity, and being more or less overshadowed by co-existing pyosalpingitis at the time when the pregnancy

took place. The twelve cases of the first group are again subdivided into five, in which there was a slight and transitory exacerbation of the inflammatory symptoms, in which spontaneous abortion occurred about the second month, in which retained products of conception called for extraction, and in which the rest in bed and the treatment adopted left the annexial condition *in statu quo ante* or somewhat improved; and into seven others, in six of which the pregnancy continued (at any rate for the time) whilst abortion took place in one, and in all these seven there was certainly no exacerbation, whilst in three there was actually a slight amelioration of the symptoms.

The eight cases of the second group were more serious. In four of them there was no clear evidence of the existence of a pus-tube, and they all recovered; in these four cases there were five pregnancies, three of which ended in abortion, whilst in two the pregnancy continued at any rate so long as the patients were under observation. The details in two or three of these instances are interesting. Thus, in the first, there was bilateral annexial inflammation with pelvic peritonitis; at the sixth week of the pregnancy there was an exacerbation of the inflammatory symptoms, with a lighting up of the peritoneal trouble and a threatening of pleurisy; there was slow improvement for two months, followed by a fresh exacerbation complicated by jaundice; and then amelioration again occurred, and the gestation continued as long at any rate as the woman was under observation. In the third patient there was a localised pelvic peritonitis, and pregnancy was at the third month; aspiration was practised through the posterior fornix vagina and some fluid and sterile pus were withdrawn; improvement, general and local, followed, the fever disappearing; twenty-five days later a spontaneous and complete abortion took place; then a progressive improvement set in; and, finally, a careful examination failed to reveal any appreciable annexial collections. The fourth case was very interesting. The patient had bilateral annexial lesions with pelvic peritonitis and recurrent attacks of entero-colitis; two pregnancies followed at an interval of a year and a half; both showed an exacerbation of all the signs and symptoms at the end of a month; in both, spontaneous, incomplete abortion, made complete by curetting, occurred; and in both a marked improvement in the state of the pelvic lesions began two months after the abortion. The last four cases in the series of twenty all ended fatally, and in every one of them there was a purulent collection in the tube, discovered clinically and confirmed at the autopsy. In the first there was a bilateral pyosalpinx and annexial inflammation; until the fourth month there was no unfavourable change, but then abortion occurred spontaneously and was immediately followed by an exacerbation of the symptoms of pyosalpinx and pelvic peritonitis; posterior colpotomy was practised twelve days later, and much pus was evacuated, but without improvement in the

patient's state; on the 29th day after the miscarriage septicæmia developed, with death (accompanied by meningitis) on the 35th; and at the autopsy general and genital tuberculosis was discovered. In another case the pregnancy was at the sixth month, and the patient had suffered from acute intestinal infection, from bilateral pyosalpinx, and from pelvic peritonitis and perityphlitis; for about a month after this date the condition appeared to be improving, and then the infective process was rekindled, along with spontaneous premature labour and a dead fœtus; the confinement was followed by aggravation of the symptoms, by the development of diffuse peritonitis, by septicæmia with affection of the joints, and by death on the third day; and the autopsy revealed peritonitis and septicæmia, secondary to purulent collections in the uterine annexa on the right side.

It is evident, from a consideration of such a series of cases as that presented by Dr. Ferroni, that to patients who have suffered from inflammatory lesions of the uterine annexa pregnancy always brings a certain amount of risk. In the instances in which the lesions are quiescent the gestation may light up inflammation and lead to abortion, whilst in those cases in which the inflammation is active, and especially in those in which it is accompanied by pyosalpinx, the danger of death from septicæmia is very considerable. Colpotomy hardly suffices for such serious developments, and consequently more serious kinds of intervention, such as annexectomy alone, with conservative Cæsarean section added to it, or with removal of the uterus as the supplementary measure, call for consideration.

MALTA FEVER IN PREGNANCY, LABOUR, AND THE PUERPERIUM.

Dr. Amédée Laffont (*Arch. mens. d'obstét. et de gynec.*, 1915, ann. iv. pp. 97-137) has made an exhaustive research into the literature of Malta fever as a complication of childbirth, and has analysed 32 recorded instances in which this malady has been associated with pregnancy, with the puerperium, and with the period of lactation. Discussing first its influence upon the genital organs in women, Dr. Laffont has found that symptoms in the reproductive system are not uncommon in Malta fever. Pain of a neuralgic kind in the ovary, inflammation of the uterine annexa, dysmenorrhœa, amenorrhœa, menorrhagia, and metrorrhagia have been frequently observed; menstrual irregularities, fœtid leucorrhœa, and genital atony have also been noticed. The micrococcus melitensis may frequently be found in the vagina of women living in Malta, and it may apparently be present for a considerable time in that situation; further, contagion by sexual intercourse is not only rendered probable, but seems to have been experimentally demonstrated. The association of Malta fever with venereal diseases, which has long been noted, may thus be explained.

Undulant fever may have an influence upon pregnancy from conception to the full term. Abortions and premature labours have been frequently observed, and they are generally produced during the period in which the temperature is rising. A few rare but well-authenticated cases would seem to prove the possibility of the passage of the micrococcus melitensis through the placenta. The full-time infants of women affected with Malta fever generally suffer in some way from the maternal infection; they rather often perish, and they are nearly always weakly. Looking at the question from the other side, it may be said that pregnancy gives no immunity against Malta fever, neither does it modify its clinical features. It may begin at any time in the course of the gestation. Malta fever may complicate a confinement case either by prolonging the labour or by predisposing to hemorrhage; the symptoms of the fever may at the time of the confinement be either increased or lessened in severity, and no good reasons for such an aggravation or attenuation of the symptoms are forthcoming. This fever, again, may so complicate the puerperium as to suggest the presence of septic infection; the rigors, the high temperature, the rapid pulse, the perspiration, the vomiting, and the tenderness and distension of the abdomen combine to form a clinical picture closely resembling that of puerperal fever. As a rule the involution of the uterus and the state of the lochia remain normal, although in a few instances of Malta fever the vaginal discharge becomes offensive. The secretion of milk is frequently delayed, and lessened when it is in existence. In women suffering from the fever the micrococcus is found in abundance in the milk; but the transference of the disease to the child by lactation would seem to be very rare, possibly on account of an acquired immunity on the part of the infant. Sometimes it may be wise to stop nursing partly on account of the mother and partly because of the child; when the fever is of recent origin, it may be best that lactation should not be attempted. The puerperium appears to favour the outbreak of Malta fever which has been latent; it may in some cases aggravate, and in others diminish, the intensity of the affection, for reasons which are as yet unknown. Generally the puerperium does not modify the evolution and progress of the undulant fever. As has been said already, a diagnosis between sepsis and Malta fever in the lying-in period is often difficult, and the blood test and cultures are essential for the clearing up of the nature of the case. Since the micrococcus melitensis itself may be the sole cause of suppuration, periostitis, endocarditis, and phlebitis, it is probable that, these complications occurring, the puerperium following or accompanying Malta fever may have been wrongly attributed to post-partum sepsis. Dr. Laffont comes to the conclusion that the only treatment necessary for a pregnant woman suffering from undulant fever is the usual medical management of that disease; the obstetrical condition is to be dealt with expectantly. The medicine

which can be trusted to do well is acetyl-salicylic acid, and it is well borne by the pregnant woman. The interruption of the pregnancy is not to be thought of; in fact everything should be done to prevent the premature expulsion of the child. It will be advisable to forbid maternal nursing, particularly when the fever is of recent origin and may therefore be expected to persist for a long time.

Dr. E. M. Williams' case would seem to be the only one recorded (*Journ. Roy. Army Med. Corps*, 1907, vol. ix. p. 59) in which the newborn infant had Malta fever at the time of birth. The evidence is almost, if not quite, convincing; for on the day following its birth the child's temperature was found to be 103° F., and four days later its blood gave the positive reaction for Malta fever. It is true that the mother's colostrum contained numerous colonies of the micrococcus melitensis; but then the child had not been put to the breast, for the mother had been known to be suffering from the malady. About three weeks previous to the child's birth, when the mother had her second rise of temperature, she had felt violent foetal movements, and Williams thought that at that moment, perhaps, the foetus became infected. This conclusion seemed to Williams to be justifiable, and Dr. Laffont brings forward in support of it the case of a five months' foetus from a woman suffering from Malta fever which showed the positive reaction six hours after its expulsion. This case was reported by Dr. Samut (*Lancet*, 1911, vol. ii. p. 878).

J. W. B.

PATHOLOGY.

UNDER THE CHARGE OF

THEODORE SHENNAN, M.D., AND JAMES MILLER, M.D.

CULTIVATION IN VIVO OF VACCINE VIRUS.

NOGUCHI has succeeded in obtaining pure cultivations *in vivo* of vaccine virus, free from bacteria (*Journ. of Exper. Med.*, 1st June 1915).

The addition of glycerine to fresh vaccine lymph results after a time in a great reduction both in the number and in the variety of the contaminating micro-organisms, without seriously impairing the activity of the virus itself. In vaccines prepared in this way, however, organisms such as staphylococci, streptococci, *B. coli communis*, *B. Welchii*, *B. xerosis*, *B. subtilis*, and some other aerobes and anaerobes have been found. Glycerine has almost no action on bacterial spores.

Noguchi employed cultivation in the rabbit's testicle, but, as the vaccine virus multiplies quickly and the inflammatory reaction and necrosis of tissues which ensue quickly suppress the bactericidal

powers of the testicular tissues and place them in a favourable state for bacterial development, the virus must first be freed from bacterial contaminations.

Glycerinated virus, free from sporogenous bacteria, is incubated at 37° C. in order to destroy practically all the bacteria present. The skin of a rabbit is then inoculated, and after four or five days the eruption is scraped and the scrapings emulsified in saline. This emulsion is shaken up with ether, at room temperature, and cultures made from it at intervals. When spores are absent sterility is usually attained in twelve hours. The vaccine emulsion so prepared is employed for the intra-testicular inoculation of rabbits.

For a successful result, the virus has to be transferred several times from rabbit to rabbit, and it may also be cultivated in the testicles of young bulls. The testicular viruses were found to be free from bacteria, and appear to be capable of indefinite transfer from one animal to another.

The vaccinal lesions produced on the skin of the calf are identical with those produced by ordinary viruses, and human beings react in an entirely typical manner.

PATHOGENIC IMPORTANCE OF B. PROTEUS GROUP.

W. P. Larson and E. T. Bell suggest that the *proteus* group of bacilli probably plays a more important part in human pathology than is generally believed (*ibid.*, 1st June 1915).

Some strains of *B. proteus* obtained from human lesions are pathogenic for rabbits, rats, and guinea-pigs. There is strong evidence that these strains are also pathogenic for man. A non-pathogenic strain may be made pathogenic by the use of aggressins or by inoculation into the anterior chamber of the eye. Cultures lose their virulence rapidly. The lesions produced in animals are either simple abscesses, proliferative lesions, or mixed exudative and proliferative lesions.

SERO-DIAGNOSIS OF TUBERCULOSIS.

E. Dubains and F. Jupille (*Ann. de l'Institut Pasteur*, April 1915) find that Besredka's tuberculin fixes complement in presence of the serum of tuberculous patients, in almost all forms of the disease. The reaction corresponds to lesions in process of involution, or which had presented previously a certain degree of activity. It is not sensibly influenced by intercurrent affections. When compared with the cuti-reaction it possesses great clinical value, and verifies the diagnosis of tuberculosis even though the clinical signs are absent or doubtful.

DISTRIBUTION OF DIPHTHEROID BACILLI.

Wm. Harris and H. W. Wade discuss this subject (*Journ. of Exper. Med.*, 1st May 1915). They mention many instances from

the literature in which organisms of this group have been isolated from pathological conditions to which they have been believed to possess etiological relationship, and they also refer to reports of their occurrence as saprophytes. They conclude that diphtheroids are widely distributed in nature, being present in the air, on the body surfaces, and at times, through contamination or indigenous, in the deeper tissues. They constitute a wider field of saprophytism than is generally appreciated. While some strains may represent pathogenes, their aggregate is patently not of the disease-producing variety. They can be cultivated from various pathological tissues to which they bear no etiological relationship, such as the lesions of tuberculosis, leprosy, blastomycosis, tertiary syphilis, and tumours of various types.

CHORIONEPITHELIOMA OF TESTICLE.

Dr. J. V. Cooke describes a case of chorionepithelioma of the testicle, with secondary growths in the brain, liver, kidneys, stomach, peritoneum, and thyroid, and has collected 46 other cases from the literature (*Johns Hopkins Hosp. Bull.*, June 1915).

The ages of the patients varied from 16 to 46 years, but the large majority of the cases occurred in individuals between 20 and 40 years of age. The right testicle was slightly more often affected than the left. In 2 cases an undescended testicle was the seat of the new growth. The duration of the disease varied from 2 months to 2½ years. In 29 cases a fatal termination was specifically mentioned. One patient appeared to be well 5 months after the operation. In 17 other cases operated on the result was not given.

The most common symptoms were referable to the secondary pulmonary growths—hæmoptysis and dyspnoea. Abdominal nodules were commonly felt. In several cases fatal hæmorrhage occurred from metastases in the lungs, stomach, or intestines. In 2 cases hypertrophy of the breasts with secretion of colostrum-like fluid was observed. Cachexia, with loss of weight and strength, was remarked in the terminal stages of all the fatal cases.

BIOLOGICAL METHODS FOR THE DIAGNOSIS OF MALIGNANT TUMOURS.

Dr. G. Mioni publishes a long article on the above subject (*Tumori*, May-June 1914), from the laboratory of Professor Alessandri.

Following a long introduction, in which he traces the development of our knowledge of immunity in general, the author goes on to describe his own observations, which are of great interest.

His investigations have to do with isohæmolysins, Elsberg's test, the antitryptic reaction, the deviation of complement reaction, and the meiostagmine reaction of Ascoli and Izar.

Isohaemolysins.—The author employed exclusively Crile's method, as it seems to have given most general satisfaction.

The blood of the patient is taken from an arm vein, and collected in two or three tubes. One sample is defibrinated, and to it is added a quantity of saline: the others are allowed to coagulate. All are placed in the ice-chamber for 24 hours.

The clear serum is separated from Nos. 2 and 3, and the corpuscles from No. 1 are washed and emulsified in saline.

A series of 16 hæmolysis tubes is put up, in each of which 0·5 c.cm. of serum and 0·5 c.cm. of corpuscular suspension are placed. These are incubated at 37° C. for two hours, and then placed in the ice-chamber for 20 hours, before reading off the results. In this manner a serum suspected of containing isohaemolysin is not only tested against its own corpuscles and against those of three other individuals, but also it is possible to ascertain the resistance of the corpuscles of the suspected blood to the action of three other serums. In the first case "the serum is pathological which dissolves the normal erythrocytes: in the second the serum is normal which dissolves pathological erythrocytes."

In 35 cases of malignant growth, in which the diagnosis was confirmed by autopsy, the first reaction (active hæmolysis) was positive in 21 (62 per cent.) and negative in 14 (38 per cent.), the latter series including 8 visceral cancers, 1 mammary cancer, 1 squamous epithelioma, and 4 sarcomata. The second reaction (passive hæmolysis) was positive in 17 cases (48 per cent.) and negative in the remainder.

In 35 control cases the first reaction was positive in 10 and negative in 25, while the second reaction was positive in 9 and negative in 26, the positive cases being cases of suppuration, acute febrile conditions, or cases of surgical tuberculosis. The practical value of the test was confirmed up to a certain point.

Elsberg's Reaction.—For the study of hæmolysis in the living patient the author followed exactly the method advised by Elsberg, injecting under the skin of the forearm or shoulder 1 c.cm. of a 10 per cent. suspension of washed red blood corpuscles. In 5 cases only, out of 35 cases of malignant disease, a nodular reddish swelling appeared, and in 4 out of 35 controls a similar result was obtained. No better results were obtained with various modifications of Elsberg's technique, and Mioni concludes that this test is not of practical value.

Antitryptic Properties of Serum.—In carrying out this test the author employed the method advised by Marcus. This author prepares the test-fluid as follows:—5 c.cm. of pure glycerine and 5 c.cm. of distilled water are shaken up with 0·1 grm. of Grûbler's trypsin. After incubating for 30 minutes at 55° C. it is again shaken, and then filtered, furnishing a clear, colourless, slightly viscid, and weakly

alkaline test-fluid. The observation material is Loeffler's serum, coagulated in Petri's capsules.

Taking a series of 12 small sterile test-tubes or watch-glasses, a drop of the test-fluid is placed in each, and to the first a drop of the patient's serum is added, to the second a drop of serum diluted with equal parts of saline, to the third a drop of serum diluted with two parts of saline, and so on. From each tube or watch-glass two loopfuls of the mixture are placed upon the surface of the Loeffler's serum, arranging the successive deposits in a circle. In the centre two loopfuls of a control mixture of test-fluid and saline are placed. The plate is incubated at 50° C. for 6 to 8 hours. Thereafter the degree of digestion of the coagulated serum is noted, from the depth of the hollows produced by the test deposits. Absence of digestion indicates inhibition of the trypsin by the antitrypsin of the patient's serum. The grade of dilution of this serum, which inhibits tryptic digestion, furnishes the antitryptic index.

In normal individuals the antitryptic index varies between 1:2 and 1:4. Mioni found that it rose to 1:7 in 2 cases of suppurating hydatids of *T. echinococcus*. In 35 cases with malignant disease the index in 3 cases was 1:4; in 6, 1:5; in 7, 1:7; in 9, 1:8; in 3, 1:9; and in 1, 1:10. Hence the reaction was positive in 32 of the cases (91.4 per cent.), a percentage similar to that obtained by other investigators who employed different technique.

Mioni concludes that the presence of a high antitryptic index in a patient in whom one can exclude an acute infection or a focal suppuration supports a diagnosis of malignant disease.

Anaphylaxis.—In these investigations the author followed the technique suggested by Pfeiffer and Finsterer. He injected guinea-pigs intra-peritoneally with 4 c.cm. of serum from a cancer patient, and after 48 hours gave a second intra-peritoneal injection of tumour extract. In a second series of observations he gave the second injection subdurally according to Besredka's method. Suitable control tests were made. The results were absolutely negative when the second injection was intra-peritoneal, and positive in one-third of the cases when it was subdural. It is possible that these apparently positive results were really due to direct mechanical or toxic effects of the injected material upon the central nervous system.

Deviation of Complement.—In some of the deviation tests Mioni used as antigen an aqueous extract of tumour, in others an extract in pure methylic alcohol, along with sheep corpuscle amboceptor, and guinea-pig complement. The test material was the blood-serum of cancerous individuals.

In 34 malignant cases, deviation was complete in 8 cases only, incomplete in 5, and negative in 15. In 6 cases the patients' serum inhibited hæmolysis by itself. In 24 normal cases the result was

negative in 15, incomplete in 5, and in 4 the serum alone inhibited haemolysis. But although the serum of some cancer patients deviates complement, Sampietro, Weinberg, and de Marchis have shown that syphilitic serum in contact with extract of carcinoma deviates complement; and as it is not always possible to exclude a syphilitic infection, the results obtained were not very satisfactory, even to the modified extent shown.

Meiostagmine Reaction.—Ascoli and Izar proposed at first an antigen prepared by means of an alcohol-ether extract of non-ulcerated tumour, but later they prepared the antigen with methylic alcohol. Micheli and Cattoretti showed that extract of the pancreas of the dog or calf formed an efficient substitute, and further experience has established the correctness of this conclusion.

The result of mixing antigen with the patient's serum is a diminution of surface tension easily appreciable by Traube's stalagmometer, which indicates the variation in the number of drops in a given uniform quantity of the mixture. Ascoli and Izar found the reaction positive in 93 out of 100 cases of malignant tumour, whereas in 103 control cases the reaction was invariably negative. Mioni, using the pancreatic antigen, obtained a positive reaction in 20 out of 35 cases. In 28 controls the reaction was negative in 26.

If the difficulty of producing efficient antigens and the ease with which these lose their activity are borne in mind, it is to be doubted whether the reaction is one which can be transferred from the laboratory to the bedside.

After removal of malignant tumours Mioni noted a progressive diminution, going on to complete disappearance, both of the isohaemolysin and of the antitryptic reaction, demonstrating that both isohaemolysin and antitryptic ferments stand in direct relationship to the presence of the neoplastic mass and are indications of the altered metabolism of the individual suffering from malignant disease.

Evidently the author considers that the antitryptic reaction is of most practical value, but he also favours Crile's test and the meiostagmine reaction, the former taken in association with the clinical data, and the latter only in the hands of experts in its employment.

A full bibliography is appended to the paper.

T. S.

NEW BOOKS.

The Biology and Treatment of Venereal Disease; and the Biology of Inflammation and its Relationship to Malignant Disease. By J. E. R. M'DONAGH, F.R.C.S.(Eng.). Pp. 590. 54 Plates and Figures in the Text. London: Harrison & Sons. 1915.

THIS is an important-looking and well-illustrated volume which presents the author's views upon the above subjects. Five hundred pages are occupied with the consideration of venereal diseases; and the remainder, apparently a somewhat meagre allowance, suffices for the discussion of the second group of important problems.

The chapters dealing with the clinical aspects of syphilis, *ulcus molle*, and gonorrhœa are, as was to be expected, well written and suggestive, an important feature being the attention given to generalised gonotoxic and gonococcal conditions. The chapters on the Wassermann reaction and other tests for syphilis, and on treatment of syphilis, on sexual neurasthenia, on venereal disease in relation to marriage and to public health, are thoroughly well done.

The rest of the book is occupied with contentious matter. In the earlier chapters the author describes the morphology and biology of the bodies which he regards as the causal organism of syphilis.

The author throws overboard so easily, as obviously and palpably incorrect, the views and statements of noted authorities when they run counter to his own opinions, that the reader who knows the careful work of these authorities is provoked to opposition, to criticism, and to scepticism as to the validity of the author's own contentions. He discusses in very full detail the staining and micro-chemical characters of the *leucocytozoon syphilidism*, as he names his "body," and places it with the coccidia. Nowhere, however, does he indicate that he has tested known coccidia or closely related forms of protozoa by similar tinctorial and chemical methods, or that he has examined in similar fashion other well-recognised inflammatory lesions and granulomata in which pyknosis, karyorrhesis, karyolysis, and budding of the nuclear chromatin may occur. Hence we cannot accept fully his claim to have disproved Hoffmann's opinion that his bodies are "körpereigene" structures. Our belief in the correctness of his statements, as a whole, is not strengthened when we read his views on the development of the lymphocyte from endothelial cells, supported as they are by illustrations (Plate XXI.) of two large phagocytes which have ingested polymorphs, which are in course of digestion in the vacuoles of the phagocyte. These he describes as developing lymphocytes.

His arguments are certainly ingenious, but not always mutually compatible, or in agreement with recognised facts of pathology. For example, we read: "It is quite conceivable that a patient could develop

diphtheria, if a colony or two contaminated a culture of staphylococci, for instance, which had been used for inoculation purposes" (p. 60).

"It must be obviously incorrect to say that a positive Wassermann reaction means that there are spirochaetae in the body" (p. 97). We should agree if he had written "necessarily" after the word "means," but this statement has to stand with the following:—"The action of treatment is primarily to destroy the spirochaetae" (p. 122); "the spirochaeta pallida is not the cause of syphilis, and its destruction does not result in the cure of the disease" (p. 347); and "the spirochaetae are mainly responsible for the lesions" (p. 122).

"Spores of the *leucocytozoon syphilidis* do not give rise to inflammation, and therefore the histological structure of any tissue in which they are present may remain unaltered" (p. 121). "The longer the spores are present in any one spot, the more chronic inflammatory changes will the local vessels exhibit" (p. 123).

We are not greatly attracted by the author's views on the biology of inflammation and its relationship to malignant new growth, and chiefly because so many statements strike us as inaccurate. As examples we may cite a few of these. "When an enormous number of endothelial cells is formed, they must ultimately either degenerate or become malignant" (p. 16). What about those rare cases of tuberculosis of lymphatic glands, which may go on for many years, and yet, when examined, show the sinuses packed with masses of endothelioid cells without any visible trace of degeneration, and certainly without malignant transformation? "Chronic interstitial nephritis . . . is usually only one of the symptoms of a generalised arteriosclerosis" (p. 153). Because, amongst other reasons, "in Hodgkin's disease the glandular enlargement may be enormous, yet there is no lymphocytosis" (p. 528), he argues that all lymphocytes circulating in the blood are probably of bone-marrow origin. "The same appearances are to be met with in glands removed from cases of Hodgkin's disease, and from the so-called lympho-sarcomatosis" (p. 540). "The term 'leucæmia' is an unfortunate one, as it means only leucocytes in the blood" (p. 535). "There are two kinds of malignancy, one which affects embryonic cells, the other which affects mature cells" (p. 522). "The more embryonic tissue is, the greater its activity, and hence the less benign it is" (p. 524). His example of embryonic malignancy is the rodent ulcer, hence, presumably, this is an extremely malignant new-growth. There is no reference to the views recently put forward that rodent ulcer may possibly not be a tumour growth proper.

The lymphocyte is the most important protective cell (chap. xlv.); it is not phagocytic (p. 529). Elastin is a *degeneration* product of connective tissue cells (p. 530).

In discussing the "so-called parasites of cancer," the author (p. 506) states dogmatically that they are neither protozoa nor nuclear degenera-

tions. They develop from the nucleolus. The expelled nucleolus increases in size until a cell is seen which can be divided into two parts—protoplasm and a nucleus. This is surely something new in pathology. And he remarks the resemblance of this cell to what he terms his syphilitic female gametocyte. We can well believe it.

Such examples might be multiplied from the text, but we have said enough to show that while we have nothing but praise for the purely clinical portions of the work, we still maintain grave doubts as to the pathology of these diseases as propounded by the author.

Medical Applied Anatomy. By T. B. JOHNSTON, M.B., Ch.B. Pp. xiv. + 436. With 146 Illustrations. London: A. & C. Black, Ltd. 1915. Price 7s. 6d. net.

THIS book is another important addition to the Edinburgh Medical Series, and the Medical Editor is to be congratulated on suggesting the subject and securing the services of such a popular lecturer as the author. The book is based on a series of post-graduate lectures delivered during the vacations of the last few years by Dr. Johnston. He was recognised by graduates as one of the most lucid and practical of our lecturers, and it is a pleasure to welcome the very much expanded lectures in book form.

The book is divided into eight chapters, and the subjects are dealt with from the point of view of systems—not regions—as is usual with surgical anatomy books. The first chapter deals with the nervous system very fully—it comprises nearly half the book. We think the diagrams might have been considerably improved in this section, as well as in some of the other sections.

The chapters on the heart and lungs are short, and give a good deal of useful information. No mention is made of Roth's sign in pericarditis with effusion, and Grocco's triangle in pleurisy with effusion. We are not told what constitutes Lombardi's "Varicose zone of alarm."

Dr. Johnston has introduced the Basle terminology throughout the book, and along with this has placed the familiar names to which all but the junior members of the profession are accustomed. We would suggest that in a future edition the value of the book might be greatly enhanced if the author collaborated with a practising physician who could submit clinical phenomena for anatomical explanation.

The Anatomy of the Human Skeleton. By J. ERNEST FRAZER, F.R.C.S.(Eng.). With 219 Illustrations. London: J. & A. Churchill. 1914. Price 21s. net.

WHEN the reviewer read the preface of this book he turned to the contents with interest, the writer's object being to get the reader

to "think of the bones as they exist in the body rather than as 'they lie' on the table before him" Whether the object of the author has been achieved is doubtful. The numerous illustrations are distinctly original, and if they will encourage anatomists and surgeons to make drawings for themselves they will have achieved an excellent purpose.

The amount of work expended by the author certainly deserves the results he hopes for, but we are afraid that "dry bones" will always be "dry bones" however they are served. The advice given in the preliminary chapter is very sound. "The majority of the figures . . . are introduced as guides; . . . anatomy cannot be learned from pictures."

The Clinical Anatomy of the Gastro-Intestinal Tract. By WINGATE TODD.

Pp. 264. With 32 Illustrations. Longmans, Green & Co. 1915.

Price 6s. net.

IN this volume the author deals chiefly with the results of recent investigations which have not yet found their way into anatomical text-books. With the exceptions of the mouth and pharynx, each part of the alimentary canal and its associated glands is dealt with from the point of view of topography, structure, vascular and nerve supply, malformations, and physiological movements.

The material has been carefully chosen. Those parts dealing with movements in the gastro-intestinal tract will be especially helpful in the interpretation of radiograms; and the bibliography appended will serve as a useful guide to original articles.

On account of older material having been largely omitted, this volume cannot be regarded as a comprehensive treatise. To senior students, however, who are desirous of bringing their studies well up to date, the book can be confidently recommended.

Essentials of Physiology. By F. A. BAINBRIDGE, M.A., M.D., D.Sc.,

and J. ACWORTH MENZIES, M.D. Pp. viii. + 434. With

134 Illustrations. London: Longmans, Green & Co. 1914.

Price 10s. 6d. net.

THIS volume is one of a series issued by the publishers, of which those on histology, morbid histology, and chemical physiology have preceded it. No indication is given as to the respective shares of the joint authors (both under the wing of Durham University) in its production. It is intended for the student preparing for a pass examination, and should be adequate for that purpose. Histology and accounts of chemical tests are reduced to a minimum, as the student is expected to have other books of reference in these departments. The book gives a clear and well-balanced account of the

subject, and is well up to date. The chapter on the organs of sense is particularly good, though it is startling to find that the description of voice and speech forms part of the section on the sense of hearing. There is an interesting paragraph on "second wind"—a subject in which the student is keenly interested, but which we do not remember to have seen discussed in a book of this class. We fear that the "strong beam of light focussed on the sclera" which is said to show Purkinje's images will prevent the student's discovering that the domestic candle is quite sufficient for the purpose. *Food-stuff* is used, legitimately no doubt, of ordinary articles of diet (milk, bread, etc.): it has usually been applied in physiological works to the proximate principles of foods, and confusion may be caused. On the whole, we have found the work careful and accurate. The illustrations are for the most part borrowed (with due acknowledgment); a few of them are effectively tinted. There is a good index, though we failed to find there vitamins or deficiency diseases, which are discussed in the text.

Human Physiology. By Professor LUIGI LUCIANA. Translated by FRANCIS A. WELBY. In Five Vols. Vol. III. Muscular and Nervous Systems. Edited by GORDON M. HOLMES, M.D. Pp. x. + 650. With Numerous Illustrations. London: Macmillan & Co. 1915. Price 18s. net.

IN these days of condensed text-books it is a relief to open a physiology in which the subjects are discussed in accordance with their physiological and scientific importance, and not with an eye to answering examination questions. It would be indeed difficult to get another physiologist who could treat such a variety of subjects with that intimacy of detail which only belongs to the researcher, and is, as a rule, only found in a monograph on a particular theme.

Volume III. is quite up to the standard of the previous volumes, though perhaps the subject-matter may not appeal so widely to practitioners of medicine. The chapter on articulation and phonation contains much that is new to English readers.

An especially attractive feature is the bibliography at the end of each chapter; to this has been added a list of recent English publications on the subject. To the advanced student this is of great value, guiding him to the original papers and facilitating his selection.

The method of introducing a subject by giving a short account of the work and views of the various workers on the subject not only keeps alive the classical experiments, but leads us by a rational method to a better appreciation of the value of modern work.

The book is well indexed, an index of subjects and of authors being given.

X-Rays: How to Produce and Interpret Them. By HAROLD MOWAT, M.D. Pp. xii. + 204. With 106 Illustrations. London: Henry Frowde and Hodder & Stoughton. 1915. Price 8s. 6d. net.

THIS little book, intended for beginners, contains much information clearly put, which should prove useful.

It is divided into two parts. Part I, which is concerned with the *production* of X-rays, deals fully—and, on the whole, carefully—with such subjects as the tube and its management, the localisation of foreign bodies, and the technique of examination. A clearer definition of the “standard position” and advice as to the points over or under which the tube should be centred in radiographing the normal would have proved useful here, and we see here too that the importance of the part under examination being absolutely still during the exposure is not insisted upon. Sandbags placed upon the plate would hardly effect this, nor would they ensure good apposition.

Part II. deals with the *interpretation* of the screen appearances and skiagrams, and the greater portion of this section is devoted to the spores and digestive tract, regions which the author rightly considers to be of outstanding importance, and for the radiographic examination of which he gives most useful hints, the remaining chapters dealing shortly with the urinary system and diseases and injuries of bones and joints.

The fact of the author being on service accounts for some sections receiving less attention than they deserve, and for minor faults; but to the beginner who does not wish to be entirely “spoon-fed” we can heartily recommend this book. It is well printed, and, with some few exceptions, the illustrations are very good.

Differential Diagnosis. By RICHARD C. CABOT, M.D. Vol. II. Pp. 709. With 254 Illustrations. London and Philadelphia: W. B. Saunders Co. 1915. Price 24s. net.

THIS volume is a continuation of the method of discussing the differential diagnosis of symptoms by means of illustrative cases, which was adopted by the author in the first volume of his work. In this, the second volume, nineteen common symptoms have been selected for illustration. They are of the most varied kind, and embrace all the different systems of the body. Each symptom is discussed in a systematic manner in a short section which deals with the method of investigating the particular complaint, and which indicates the kind of cause which is probably responsible. Thereafter follows a series of cases, selected to illustrate all or nearly all the possibilities. Each case is recounted under three main headings. First, the symptoms and signs, as shown by the patient's history and by examination, are given in detail, together with any points in the family history and previous health

which may be of importance ; then follows a brief discussion on the case ; finally the outcome is detailed. Many of the cases described are of great complexity, and if studied in detail and with care, it is of much interest and benefit to form a diagnosis from the data supplied, and then compare it with the outcome of the case. The book is illustrated profusely with diagrams and photographs. The former are extremely artistic, and add greatly to the ease with which the cases may be followed. The photographs are not quite so good, and many are totally devoid of the sense of proportion or of perspective. We would instance Fig. 21 as an extreme example. In the text there are very few errors. In Case CXLII. the blood-count there given is that of a severe pernicious anemia, but no mention is made of it in the diagnosis, which is given as ulcer of the stomach, and was confirmed post-mortem. Perhaps there is a misprint in the figures. The book is one of extreme interest, and is unique in the manner in which the subject of diagnosis is treated.

NEW EDITIONS.

Text-Book of Forensic Medicine and Toxicology. By R. J. M. BUCHANAN, M.D. Eighth Edition. Pp. 417. Edinburgh: E. & S. Livingstone. 1915.

THIS is the eighth edition of what was originally Husband's *Medical Jurisprudence*, and, needless to say, it has undergone many alterations in the hands of the present editor. In many respects it is well able to stand comparison with the smaller text-books in forensic medicine, and the part dealing with toxicology is especially well done, and should prove useful to students preparing for examination.

As is apt to occur when an attempt is made to bring an old book up to date, many statements remain which subsequent investigations have proved to be wrong or worthless from a practical point of view. Instances of this are frequent, and many chapters would stand more careful revision or rewriting.

The illustrations are well chosen, and on the whole good, especially those of crystalline poisons, but exception must be taken to a few, such as that of human milk, which conveys nothing to the reader.

A Text-Book of Pharmacology and Therapeutics. By ARTHUR R. CUSHNY, M.A., M.D., F.R.S. Sixth Edition. Pp. 692. With 70 Illustrations. London: J. & A. Churchill. 1915. Price 15s. net.

SUCCESSIVE editions of this already well-known book serve to strengthen its position as a very reliable guide to the study of pharmacology and practice of therapeutics. Each substance described

is amply treated, and the perusal of the various articles leaves the reader with a feeling of satisfaction at the manner and fulness of treatment of the subject. The relation between pharmacological action and therapeutic effect is invariably well balanced, so that it is easy for the reader to reconcile the one with the other, and the whole work indicates a thoroughly scientific outlook in combination with sound clinical knowledge. The author does not regard strychnia as a useful cardiac stimulant, and in this view he will find many to agree with him, while recent work on this subject confirms his opinion. One would have liked to see the danger of pilocarpin in pulmonary oedema emphasised, although it is true that he adverts to it in an indirect manner.

The volume is one which could not well be dispensed with, and the publishers have issued the book in an attractive form and have carried out the illustrations in a manner which leaves nothing to be desired.

Aids to Tropical Medicine. By G. E. BROOKE. Second Edition. Pp. xii. + 230. With 37 Illustrations. London: Baillière, Tindal & Cox. 1915. Price 3s. net.

THAT a second edition of this little volume is called for is evidence that it has met a felt want. In the present issue the subject-matter has been carefully revised and in great part rewritten. A number of new chapters have been added, which add materially to the value of the book. It is up to date and is well and clearly written, and may be recommended as a concise and reliable summary of the subject of which it treats. In the chapters on fleas, flies, mosquitoes, and rats, much information is brought together in handy form. There is a good index.

Transactions of the College of Physicians, Philadelphia. Third Series. Vol. XXXVI. 1914.

THIS volume contains papers of surgical, medical, pathological, and public health interest read before the College during the year. The majority of the eighteen papers are of practical importance, although they break little new ground. There are papers by Hare, Spiller, and other well-known authors.

BOOKS RECEIVED.

ANNUAL Report of the Sanitary Commissioner with the Government of India for 1913.			(Calcutta, 1915)	—
BEATTIE, J. M. Post-Mortem Methods	(Cambridge University Press)	10s. 6d.		
BEAUCH, W. F. Psychography	(W. B. Saunders Co.)	—		
CLINTON of John B. Murphy. Vol. IV., No. 2	(W. B. Saunders Co.)	—		
COLLECTION Papers of the Mayo Clinic, 1914. Vol. VI.	(W. B. Saunders Co.)	—		
CRILE, G. W. The Origin and Nature of the Emotions	(W. B. Saunders Co.)	—		

CUSHNY, A. R. A Text-Book of Pharmacology and Therapeutics. Sixth Edition.	(J. & A. Churchill)	15s.
DAVIS, G. G. Applied Anatomy. Third Edition	(J. B. Lippincott Co.)	24s.
DENNETT, R. H. Simplified Infant Feeding	(J. B. Lippincott Co.)	12s. 6d.
DORLAND, W. A. N. The Pocket Medical Dictionary. Ninth Edition (W. B. Saunders Co.)	—	—
EDEX, T. W. A Manual of Midwifery. Fourth Edition	(J. & A. Churchill)	16s.
ENCYCLOPEDIA Medica. Second Edition. Vol. II. As-Ch.	(W. Green & Son)	20s.
GANT, S. W. Diarrheal, Inflammatory, Obstructive, and Parasitic Diseases of the Gastro-Intestinal Tract	(W. B. Saunders Co.)	—
GAUVAIN, H. J. Medical Report of Treloar Cripples' Hospital and College, Alton, Hampshire	(H. Marshall & Son)	1s.
HADDEN, D. The Gynecology of Obstetrics	(Macmillan & Co., Ltd.)	17s.
HOLLAND, J. W. A Text-Book of Medical Chemistry and Toxicology. Fourth Edition.	(W. B. Saunders Co.)	—
INDEX of Prognosis and End-Results of Treatment. Edited by A. Rendle Short	(J. Wright & Sons, Ltd.)	21s.
INDEX of Treatment. Edited by R. Hutchison and J. Sherren. Seventh Edition.	(J. Wright & Sons, Ltd.)	21s.
KENWOOD, H. R. Health in the Camp	(H. K. Lewis & Co., Ltd.)	3d.
LEJARS, F. Urgent Surgery. Vol. II.	(J. Wright & Sons, Ltd.)	25s.
LLEWELLYN, LL. J., and A. B. JONES. Fibrositis	(W. Heinemann)	25s.
MACMILLAN, J. C. Infant Health	(H. Frowde, Hodder & Stoughton)	2s.
MALLORY, F. B., and J. H. WRIGHT. Pathological Technique. Sixth Edition.	(W. B. Saunders Co.)	—
MEDICAL Annual Synoptical Index, 1905-1914	(J. Wright & Sons, Ltd.)	8s. 6d.
MEDICAL Clinics of Chicago. Vol. I, No. 1	(W. B. Saunders Co.)	—
MILNE, R. The Prevention of Infectious Diseases	—	—
MORROW, A. S. Diagnostic and Therapeutic Technic. Second Edition.	(W. B. Saunders Co.)	dol. 5.
ORTNER, N., and N. B. PORTER. Treatment of Internal Diseases. Third Edition.	(J. B. Lippincott Co.)	21s.
ROMER, F. Modern Bonesetting for the Medical Profession	(W. Heinemann)	5s.
ROWLANDS, R. P., and P. TURNER. The Operations of Surgery (Jacobson). Sixth Edition. Vols. I. and II.	(J. & A. Churchill)	£2. 10s.
SCUDDER, C. L. The Treatment of Fractures. Eighth Edition	(W. B. Saunders Co.)	—
STEVENS, A. A. A Manual of the Practice of Medicine. Tenth Edition.	(W. B. Saunders Co.)	—
THOMAS, B. A., and R. H. IVY. Applied Immunology	(J. B. Lippincott Co.)	16s.
THOMSON, H. C. Diseases of the Nervous System	(Cassell & Co., Ltd.)	10s. 6d.
THRESH, J. C. A Simple Method of Water Analysis	(J. & A. Churchill)	2s. 6d.
TRANSACTIONS of the American Pediatric Society, 1914. Vol. XXVI.	—	—
WILSON, J. C. A Handbook of Medical Diagnosis	(J. B. Lippincott Co.)	25s.
WRIGHT, SIR A. E. Wound Infections	(Hodder & Stoughton)	2s. 6d.

ANALYTICAL REPORT.

"LUBAFAX" SURGICAL LUBRICANT.

(BURROUGHS WELLCOME & Co.)

To meet the demand for a surgical lubricant which is at once reliably antiseptic and non-irritating to mucous membranes, Messrs. Burroughs Wellcome & Co. have introduced this preparation. It has the advantages of being non-greasy and soluble in water, so that it can readily be washed from catheters, specula, and other instruments, and it has no deleterious effects on the instruments or on their rubber attachments. It is put up in collapsible tubes which are convenient and cleanly in use.

EDINBURGH MEDICAL JOURNAL.

EDITORIAL NOTES.

Notes from a Base Hospital in France.

WE are indebted to a correspondent for the following notes, which have been passed for publication by the Authorities after emendation:—

Having been appointed by the War Office to the surgical division of a general hospital, I joined the staff and sailed the same afternoon.

While our own hospital was in process of erection the medical officers were afforded opportunities of observing the work performed in the other hospitals. It was an advantage for us to see these hospitals in full working order, and to see operations performed in them by surgeons who had already gained experience.

The opening of our own hospital and of another alongside coincided with the completion of the new siding and debarkation platform at the station. This platform is long enough to take the longest of hospital trains, and wide enough to accommodate the entire fleet of motor ambulances employed for evacuation, which is thereby greatly facilitated. The roads around and within the camp are so laid out that the ambulance cars make a circular tour, dropping the stretcher-cases at the receiving rooms of the various hospitals and returning to the station for a second load without crossing one another, so that even with heavy traffic there is no risk of a block. Motor char-a-banes are provided for sitting-up cases, so that these are distributed with great rapidity.

Many of us had seen the emptying of an ambulance train at home, but never one like this — the first one to use the new siding. It contained some 450 men wounded in the fighting, and as they emerged from the shade of the train the brilliant sunshine exaggerated the haggard expression of their faces and the clay and mud on their uniforms, making these almost unrecognisable; it was difficult to differentiate the officers, for they also were mud-stained, unshaven, and haggard.

So perfect were the arrangements for their reception that before the last men were out of the train the first arrivals were already washed and comfortably in bed in hospital with a bowl of hot tea or soup by their side.

In dealing with recent casualties, roughly those sustained within the previous forty-eight hours, and excluding lesions of the viscera, as these are retained in the field-ambulances and clearing stations, attention had to be directed chiefly to the recognition of commencing grave infections of the cellular tissue, and in the case of the extremities, to the recognition of injuries to the main blood-vessels.

With regard to the grave infections, their occurrence can be suspected from the appearance of illness as the patients pass through the reception room and from a change in the pulse at the wrist. It may be laid down as a guide for the receiving officer that if a man looks ill and his pulse is over a hundred he has either lost a lot of blood, evidence of which would be readily available, or he is the subject of an infection that calls for immediate attention. Given some two hundred or more admissions within the space of an hour or two, it is important to be able to differentiate without delay those that require immediate attention from those that can afford to wait.

The cases with wounds in which a commencing grave infection is suspected are taken to the theatre, and when the original dressing is removed there is obvious swelling, discoloration, and tenderness, and, in the case of gas phlegmon of the subcutaneous cellular tissue, there is emphysema or a curious resonance on percussion. There is general agreement as to the method of checking these infections. Under some form of anæsthesia free incisions are made extending beyond the assumed area of infection; the tissues are irrigated with peroxide of hydrogen or a solution of hypochlorous acid; the wound is kept open by the insertion of large rubber drains, rolls of rubber dam being, on the whole, preferable to tubing of comparatively rigid indiarubber, or by packing with loose gauze containing an excess of hypertonic salt solution. There are, of course, more serious cases with extensive laceration and pounding of the tissues, with gas phlegmon of the intermuscular cellular tissue, in which, especially if associated with a comminuted fracture, a comminuted fracture into a joint, or injury to the vessels or nerves, immediate amputation is required in order to save life or to get rid of a limb that is not worth saving. I am making no attempt in this place to deal with the large subject of the treatment of infected wounds, but am only touching on it as it concerns the receiving medical officers when dealing with a large convoy of wounded that has just been admitted to the wards of a general hospital.

The second group of cases that calls for immediate attention is that in which the circulation through the main vessels of a limb has been or is being interfered with.

Compared with civil practice, the risk of overlooking such cases scattered amidst a large number of recent admissions is considerable. In fact, unless the medical officer is on the lookout for them, he is storing up for himself some of the most unpleasant surprises that occur

in surgical practice. Comparatively trivial-looking wounds, caused by rifle bullets or fragments of shrapnel, may be attended with damage to the main vessels which, in the course of a day or two, will be made manifest by the discovery that the limb is dying or dead. I do not mean to imply that the earlier recognition of the vascular lesion would prevent the gangrene, but the treatment of the wound, in the first instance, would be materially influenced by the knowledge that the circulation through the main vessels had been or is about to be arrested. These remarks apply particularly to wounds of the lower part of the thigh and popliteal space.

Apart from these two groups of urgent cases, the work in the base hospitals in France is so similar to that in the corresponding hospitals at home that little in the way of comment is called for. There are, perhaps, a larger number of gunshot injuries of the skull requiring opening up, the removal of depressed fragments of the inner table, disinfection, and drainage, but this depends on what has been done in the clearing stations through which the wounded have passed.

There were several cases of paraplegia following gunshot injury that raised questions that were new to us. We came to realise that a bullet or piece of shrapnel does not require to come into immediate contact with the spinal cord in order to abolish its functions, and that these cases of traumatic paraplegia are by no means analogous to the "broken back" of civil practice in Great Britain. They are more serious, quite apart from the infective element due to the presence of a wound. It took some time for us to realise the amount of damage that a missile propelled by cordite can inflict upon the tissues at a distance from the actual track of the missile.

Apropos of paraplegia from gunshot injury, we had a case which shows how misleading may be the statement of any man as to how he met with his wound. A man of quite average intelligence was admitted with complete paraplegia and a small wound in the vicinity of the mid-dorsal region of the spine. He described how he was lying on his belly, in a listening post with two other men, when he was hit in the back, and one of his pals was hit in the leg, by rifle fire from our own men in a trench some thirty yards in the rear. He was positive about this, and stuck to it in spite of repeated cross-examination. He died some days later, when I was able to demonstrate that the cause of his paraplegia was not an English rifle bullet but a piece of shrapnel of German origin. Uncorrected, this man's statement might have been quoted in support of the contention that our soldiers suffer from our own fire as well as from that of the enemy.

Few gunshot wounds of the abdomen reach the base hospitals; a certain number that have been treated on expectant lines get this length, only to die of septic peritonitis, while a still smaller number escape this fate through the risky portal of a circumscribed abscess. In a

class by themselves are cases in which a gunshot wound of the iliac bone is complicated by faecal discharge from a lesion of the great or small intestine that has been shut off successfully from the peritoneal cavity.

Now and then we saw a man with the healed scars of entrance and exit wounds so situated as to warrant the belief that the missile, usually a rifle bullet, had traversed not only the peritoneal cavity but one or more of the contained viscera. In view of later experience gained at the front I am one of those who doubt the possibility of recovery without operation from perforation of the intestine by the missiles employed in this war. This is a big question, however, that must be discussed elsewhere.

These notes refer to a comparatively short term of service with a general hospital, and are to be regarded merely as the impressions of a civil surgeon in commencing work at a base hospital in France.

Eusol in the Treatment of Gas Gangrene.

WE recently * referred in this column to certain investigations which have been carried out in the Pathological Department of the University with the object of providing an antiseptic agent suitable for use in the field or in the clearing hospitals, and capable of preventing or arresting the more virulent wound infections which have proved so disastrous in the present war.

The preparations of hypochlorous acid—eusol and eupad—suggested by Professor Lorrain Smith and his colleagues have already had an extensive trial in the various military hospitals in the Edinburgh district as well as elsewhere, and have abundantly confirmed the claims made for them as a result of elaborate laboratory tests. The cases which reach these hospitals, however, do not as a rule provide the conditions necessary for a satisfactory proof of the efficacy of these agents for the main purposes for which they are intended. It is at the hospitals close to the fighting line that the most serious wounds, complicated by grave infections with gas-forming organisms, are seen, and it is there that preventive antiseptic agents can best be tested.

It is with special satisfaction that we notice here an important contribution to this subject made by one of our colleagues, Captain John Fraser, R.A.M.C., who has been employing eusol and eupad in a clearing hospital in France since June of this year, under the most favourable conditions for estimating their value. His present communication † deals with the use of hypochlorous acid in the treatment of gas gangrene, and goes far to establish its superiority over the antiseptics hitherto employed to combat this most fatal complication of wounds.

* September 1915, p. 162.

† *Brit. Med. Journ.*, 9th October 1915.

Nine consecutive cases of severe gas gangrene are reported, and of these eight recovered. In the ninth case the gangrenous process was arrested but the patient died of leptomeningitis. This is a very striking record, and not only warrants, but clamantly calls for, a more extended use of the methods adopted.

One case is specially noteworthy. The patient had been wounded through the soft tissues of the right calf five days before admission to hospital, and his condition was grave in the extreme. Below the knee the limb was emphysematous and cold, and from the knee to the groin gas could be detected on palpation and percussion. After due deliberation the limb was amputated through the middle of the thigh by anterior and posterior flaps, and the parts above were freely incised and disinfected with eusol. The gas gangrene was immediately arrested and the patient rapidly recovered.

Such a result is not only eminently creditable to the skill and decision of the surgeon, but goes far to establish the value of the antiseptic agent used, and to counteract the pessimistic views regarding gas gangrene expressed by another writer in the same issue of the journal in which Captain Fraser's paper is published.

Laughter and Hate. In a volume recently published Professor Crile proposes a new theory of laughter. All the comedies of Nature, he believes, may be divided into two acts. Act I. contains an emotional stimulus to muscular exertion—thus, a toddling child stumbles and the spectator prepares in alarm to spring to the rescue. In Act II., however, the stimulus is suddenly withdrawn—the child seats itself comfortably on mother earth, and the spectator greets this simple *dénouement* with grateful laughter. The energy evoked by emotion has to be dissipated, and the facial and powerful respiratory muscles have been adapted to undertake this task. Man shares his risibility with the monkey; in arboreal creatures, clinging to the boughs with hands and feet, no other sets of muscles could be so conveniently spared for the purpose.

This theory explains why laughing is sometimes, but not always, caused by tickling. No amusement is caused by a foreign particle in the nose or larynx, for here the stimulation is at once followed by the muscular activity of sneezing or coughing. The tickling ceptors of the skin, which respond to a delicate touch, are adapted to give protection from insects. Their stimulation is ordinarily followed by a movement calculated to brush away such an offender; but when it is perceived that a friendly finger is the exciting agent, and that consequently no movement is needful, then laughing or smiling results. Similar reasoning applies in the case of the tickling ceptors over the ribs. These reply to deep-seated pressure and were probably evolved, Professor

Crile thinks, in the days of tooth and claw fighting. Unless it is clearly understood to be jocularly intended, tickling in this region causes anger and violent struggles to escape.

Superfluous products of emotion can be consumed by the respiratory muscles in song no less than in laughter. It would seem, however, that the "Hymn of Hate" is a physiological mistake as well as an error of taste. A fit of passion may, indeed, for the time being energise a man to the highest pitch of fighting efficiency,* but prolonged emotion always ends in exhaustion and bodily hurt. Lissauer's words constantly renew the emotional stimulus, and for this reason the curse must eventually come home to roost. Hymns of hate are no new invention. In 1813 Arndt produced some stirring examples; but centuries before that date the bards of all nations composed verses which were potent, it was fondly supposed, to bleach the hair and dissolve the bones of a foe; and these verses in turn but echoed the incantations of a still more primitive mimetic sorcery. Such arts have always proved chiefly harmful to those who practised them. Our enemies might remember their own proverb: "Hass und Neid bringen viel Leid."

CASUALTIES.

KILLED in France on 1st October, Captain THOMAS HENRY STANLEY BELL, R.A.M.C.

Captain Bell was educated at the Universities of Glasgow and Edinburgh, and graduated M.B., Ch.B., at Edinburgh in 1914. He was for four years a member of the Students' Representative Council in Edinburgh, and served in the Serbian Army Medical Corps during the war in the Balkans.

KILLED in France on 3rd October, Captain SYDNEY FRANCES MACALPINE CESARI, R.A.M.C.

Captain Cesari graduated M.B., Ch.B., at Edinburgh University in 1913, and afterwards acted as house-physician in the Royal Infirmary.

KILLED in France on 26th September, Lieutenant ROBERT MONTGOMERY, R.A.M.C.

Lieutenant Montgomery graduated M.B., Ch.B., at Edinburgh University in 1913.

KILLED in France in October, Second-Lieutenant B. H. WATT, 7th Cameron Highlanders.

Lieutenant Watt was an M.A. of Edinburgh University, and for a time studied medicine. He was president of the University Union in 1904-5, and in other capacities played a prominent part in the undergraduate life of the Edinburgh School. He subsequently was engaged in dramatic and literary work.

* See Dr. A. E. Shipley on "Hate," *Cornhill Magazine*, September 1915.

THE names of the following students of medicine appear in recent casualty lists:—

LIEUTENANT CHARLES GILLESPIE, 4th Batt. Highland Light Infantry, died of wounds in France, aged 22.

Lieutenant Gillespie was a student, in his third year, at St. Andrews University. He had already taken the B.Sc. degree, and was a well-known athlete.

LIEUTENANT HUGH A. MUNRO, 8th Argyll and Sutherland Highlanders, killed in France by a bomb explosion, aged 22.

Lieutenant Munro, a son of Mr. Neil Munro, the novelist, was a final year student of Glasgow University.

LIEUTENANT JAMES GRANT ALLAN, 9th Gordon Highlanders, killed, aged 20.

Lieutenant Allan was a B.Sc. of Edinburgh University, and had entered the Faculty of Medicine.

SECOND-LIEUTENANT GEORGE M. CALDER, 8th Batt. Seaforth Highlanders (Ross-shire Buffs), killed in France, 25th-28th September, aged 24.

Lieutenant Calder was an M.A. of Aberdeen, and was in his second year of medicine when the war broke out.

LIEUTENANT HAROLD A. CRUICKSHANK, 2nd Batt. Royal Scots Fusiliers, killed in France, 28th September.

Lieutenant Cruickshank was in his third year of medical study at the University of Glasgow.

CAPTAIN THOMAS PRETSILL FINLAY, 2nd Batt. Gordon Highlanders, killed in France, 25th-28th September.

Captain Finlay was in his final year in medicine at Glasgow University.

CAPTAIN GEORGE MELVEN HARLEY, 12th Batt. Highland Light Infantry, killed in France, 25th September, aged 23.

Captain Harley was studying medicine at the University of Glasgow.

SECOND-LIEUTENANT IAN C. MACPHERSON, 5th Batt. Gordon Highlanders, killed in France.

Lieutenant Macpherson was an M.A. of Aberdeen, and was studying medicine when the war broke out.

PRIVATE FREDERICK MILNE, Gordon Highlanders, killed in France.

Private Milne was studying medicine at the University of Aberdeen.

LIEUTENANT FREDERICK J. G. ROLLAND, 6th Batt. King's Own Scottish Borderers, killed in France on 25th September, aged 22.

Lieutenant Rolland was educated at Glasgow University, where he took the M.A., and was studying medicine.

SECOND-LIEUTENANT ANDREW STENHOUSE, 10th Batt. Scottish Rifles (Cameronians), died in France of wounds received on 25th-27th September.

Lieutenant Stenhouse was studying medicine at the University of Glasgow.

**Edinburgh University
Graduation.**

THE following, having passed the special final examination held in October, graduated *Bachelor of Medicine and Bachelor of Surgery* on 15th

October:—

Mirza Hasan Alikhan, India; Thomas Chalmers Bowie, Scotland; Alexander Fraser Campbell, Scotland; Edward James Clark, Scotland; Percy Barnard Corbett (Lieut., R.A.M.C., S.R.), England; John Dick, Scotland (with second-class honours); Robert Burns Eadie, England; Peter Williams Edwards (Lieut., R.A.M.C., S.R.), Wales; George Elsworth, England; Helen Mitchell Gall, Scotland; William Goldie, M.A. (Lieut., 6th Royal Scots), Scotland; Ewart Stanley Hawkes, England; Arthur Norman Homewood, Australia; Gordon Lilico (Surg. Prob., R.N.V.R.), England; Thomas Jones Lloyd, Wales; John McGarrity, Scotland; Charles Fellowes MacLachlan, Scotland; Alexander John Reid Taylor, Scotland; William Egbert Thompson, B.A. (Mt. All. Can.) Canada (*in absentia*); Anthony Alfred Watson, England.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH, ROYAL COLLEGE OF SURGEONS OF EDINBURGH, AND ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—

The following candidates, having passed the requisite examinations of the above Board on 2nd October 1915, were admitted Diplomates in Public Health (D.P.H.):—Mary Agnes Beausang Murphy, M.B., B.Ch.(Irel.), Mansfield, Notts; James Crockett, M.D.(Edin.), Bridge-of-Weir; Wilfrid Samuel Hamilton Campbell, M.B., Ch.B.(Edin.), Edinburgh; John Carstairs Drysdale, M.B., Ch.B.(Edin.), Edinburgh; Kenneth Alexander Maclean, M.B., Ch.B.(Edin.), Edinburgh.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH.—The following gentlemen, having passed the requisite examinations, have been admitted Fellows:—Cecil Burnham, M.B., Ch.B.(Edin.); Charles Gibson, M.R.C.S. Eng., L.R.C.P.(Lond.), M.B., B.S.(Univ. Lond.); Evan Greene, M.D., C.M.(McGill Univ.), Montreal; Charles Henry Hayton, L.R.C.S.E. (Triple Qualification); Satya Sakha Maitra, L.M. & S.(Calcutta), L.R.C.S.E.; Abraham Zadok Philips, M.D.(Edin.); James Coubro Potter, M.D.(Edin.), L.R.C.S.E. (Triple Qualification); Vinayak Laxwan Sathe, L.M. & S.(Bombay), L.R.C.S.E.;

and William Douglas Yuille, L.R.C.S.E. (Triple Qualification) ; Harold Chaffer, L.R.C.S.E., etc., Blackpool ; James Alexander Cowie, M.D. Univ. Glas., M.R.C.S. Eng., etc., Masterton, New Zealand ; Alan Murray Stuart, M.R.C.S. (Eng.), etc., Leamore, Walsall ; Percy Charles Woollatt, M.R.C.S. Eng., etc., H.B.M.'s Consulate, Shiraz.

Triple Qualification. THE following have passed the examinations for the Triple Qualification :—

First Examination.—Edward J. Pearson (with distinction), Trevor F. Thomas, Thomas F. Minford, Maurice J. Woodberg, Thomas R. O'Keefe, William Runciman, and Gordon S. Woodhead.

Second Examination.—Samuel S. Barton, Lennie P. Samarasingha, Don A. Walpole, George C. Cossar, Thomas L. Edwards, Allan P. McLeod, Daniel C. Howard, John T. W. Gale, and Donald L. Henderson.

Third Examination.—Mary G. Jones, Don A. Jayasingha, Gilbert L. Stanley, David S. Taylor, James Byrne, Stanley W. Hoyland, Jamie I. McEirnie, John L. West, Michael Campbell, Henry G. Fitzmaurice, Alfred Black, George L. Pillans, James S. Durward, Reginald J. T. Malcolm-Gasper, Harold C. A. Haynes, Edwin Butler, and Edward M. L. Morgan.

Final Examination.—Joseph John Armistead, Kirkcudbrightshire ; Edwin Arthur Blok, Panadare, Ceylon ; Andrew Mathewson, Newtonstewart, Ireland ; William Henry Arthur Douglas Sutton, St. Heliers, Jersey ; Octavis Walter Bateman, Cork ; John Phillips Fairley, Leith ; Edward Albert Neilson, Wellington, New Zealand ; Maheput Seeraj, British Guiana ; John Wight Robertson, Edinburgh ; Joseph Elias Lezama, Trinidad, British West Indies ; William Primrose Walker, Edinburgh ; Joseph Sydney Dickson, M.B., Kingston, Ontario, Canada ; Douglas Charles Murray Page, Edinburgh ; William Turner, Belfast ; Archibald Evans, Merthyr Tydvil ; Jesudason Sellyah David, Palamcottah, India ; Owen Richard Jones, Hucknall, Notts ; Alexander Gray McKee, Newbliss, Co. Monaghan ; George Edward Mendis, Ceylon ; and Thomas Weir Drummond, Greenock.

THE DANGERS OF ARTIFICIAL PNEUMOTHORAX.

By H. DE CARLE WOODCOCK, M.D., M.R.C.S., D.P.H., M.R.C.P.(Edin.).

THERE are dangers in connection with the production of artificial pneumothorax, but the greatest—and about this let there be no mistake—is the neglect in which it is held. When you are by the side of a patient suffering from incurable phthisis, you ask yourself: “Will artificial pneumothorax do any good here?” If it will, you may bring your patient a reprieve. Again, when you are confronted by a patient who, if he can make use of every aid that our art can give him, is probably curable, you ask: “Can I hasten the cure?” And when the disease is present indeed, but in its earliest and most easily curable stage, you again ask yourself: “Should the patient run a present risk, when the danger is in the future and there is time to try other and less severe methods?” Such an attitude towards all the grievous needs of various patients is a sensible one; it is not yet, but it doubtless will be, the attitude of the medical practitioner towards this form of treatment or some perfected variant of it. The value of the method can only be understood by the knowledge of its dangers and drawbacks, and in this paper the risks will be carefully considered.

All of us have met with and shared a belief that the operation is sometimes done by men who at first are not obsessed by the necessity for a careful technique. This careless spirit is quickly brought to its knees. Again, there are men who share the feeling voiced by Vere Pearson that mild methods of hygiene treatment are too readily relinquished by some in favour of this more drastic pressure therapy. Pearson’s protest is justified more in the case of rich patients who can “afford” than in the case of the poor who must quickly go back to the mill. To another kind of censor I confess an antipathy—the ultra-clever critic who in the very order of things meets with a limited executive success in his own attempts and is temperamentally obliged to use his ability of expression to excuse his own failure and belittle the work of the more fortunate. But to the thoughtful and conservative physician the historic fact that deaths, sudden and fear-compelling, have occurred in connection with this operation has been a cause of grave disquiet. Certain published reports of post-mortem examinations which might have added to our

knowledge have led rather to confusion. It has been too readily admitted that gas embolism is the most common cause of sudden death during the introduction of gas into the intrapleural space, and in some cases the verdict has been given before the inquiry. Again, when a post-mortem examination might have thrown great light on the cause of this sudden death, sure enough the fool in the family has persuaded the relatives to withhold permission for it. My own observations have inclined me to the opinion that sudden catastrophes have been ascribed to gas embolism without sufficient proof or even sufficient thought. We therefore come to this, that the dangers of the operation have been sufficiently appreciated, but that the fear may have misguided the observer. This is unfortunate, for men have undoubtedly lost courage, death from gas embolism being a sinister event. To speak of such deaths as purely accidental is a descriptive inaccuracy, and it does not tend to courage in a practitioner when he fears his own hand. Saugman, when at the International Congress, troubled, perhaps, by the inelasticity of his English, illustrated the occasional abruptness of death from gas embolism by a snap of his finger and thumb. Brauer and Spengler have put on record their regret that deaths have occurred when the patient, not being far gone in the disease, might have recovered if the physician could have foreseen. Tradition supports Brauer and Spengler. Descriptions of obsolete operations in pre-anæsthetic days have disturbed us. We can hear, all the way down the years, the hissing of air entering the opened veins of the neck, as described in some far away textbook—a very litany of fear.

Yet, though in the early operations at Armley and Killingbeck we were afraid, the fear eventually left but a legacy of caution. Our results have been very good. Moynihan has recently heartened us by telling us that no deaths from injection of gas into the tissues occurred in the base hospitals of the Expeditionary Force. The value of this testimony is qualified by the fact that most of the injections mentioned by Moynihan must have been in the course of the systemic vessels, ours among the pulmonary veins, which are carrying blood to the left side of the heart, there to be switched to the cerebral arterioles. Lister is inclined to favour almost absolute oxygen (the gas used in the base hospitals), but to condemn nitrogen. His primary injections are made with oxygen, and this is a practice confirmed by many operators. However, the published papers of

the continental writers do not seem to give an out-and-out support to Lister. Their cases do not suggest the absolute harmlessness of any one gas. Saugman speaks of two sudden deaths in his practice. He speaks of one in which "gaseous embolism cannot be excluded, though the apparatus was filled with oxygen." He tells us he drove his needle into a dangerous depth and wounded a bronchus and a vein. He sees in his case the possibility of embolism from alveolar air. Certainly we may conclude that we must keep away from the root of the lung, for there we find the most vulnerable structures. We must not dig deep, and we may use oxygen in preference to nitrogen, recognising the one gas as more readily absorbed by the blood. Professor Jamieson of Leeds tells me that there should *à priori* be little danger of gas embolism in the tissue outside the lung, and that anastomosis between the systemic and the pulmonary venous circulations is not likely to be a source of danger. Any gas in the anastomosing channels would have, as it were, to swim against the tide. Jamieson will, however, only speak from the point of view of the probable, and he agrees that the actual must underwrite his statement, based as it is on the anatomy of healthy tissues. Remember that vessels large enough to be canalised by a needle of the calibre used are not found near the surface. Pathological conditions may qualify this, but pathological conditions are chiefly referable to the deeper structures. We may then safely say that the danger is slight in tissues external to the lung and almost negligible outside the costal pleura. In lungs and in pleura grossly diseased, the veins, superficial and deep, are thickened, stiff, and enlarged. A tear in these structures, and gas may be sucked in. That air may escape from torn alveoli has already been mentioned, and a torn bronchus, together with an open vein, invites gas embolism. We may be in danger of gas embolism without pushing the needle deep into the lung. I have seen a rapidly produced and well-marked superficial surgical emphysema follow a shallow puncture. The needle had only dipped under the skin when there was a manometric negative rise. This, being so unusual, held my hand. No gas had been introduced. This occurrence appeared to me to be of some significance. It is difficult to imagine a large vein being injured in the course of such a shallow puncture. I had evidently lacerated the lung, and yet the patient was not a penny the worse. This rather strengthened my feeling that the escape of alveolar air is not often a source of danger.

It is noteworthy that gas embolism is spoken of almost solely in connection with the induction of artificial pneumothorax. It is, however, true that it has occurred in other surgical procedures connected with the lung. Such a case is mentioned in a German publication. Yet a puncture on behalf of diagnosis is day by day being used in this place and that, and we hear of no cases of embolism; therefore it cannot be a common accident. Later I shall describe a case of some ambiguity, where a puncture of this kind was followed by symptoms which could not clearly be explained. Brauer concludes, from his studies of puncture of the intrapleural space in healthy dogs, that in such experimental punctures some slight injury to the lung is inevitable. Parry Morgan accepts this statement and builds on it, saying that the movements of the manometer when the needle enters the intrapleural space are brought about by alveolar air which has escaped. It would seem that escape of alveolar air and injury to the blood-vessels might dangerously synchronise. There must be frequent opportunity for such accidents if the anatomical or pathological conditions are favourable. Accidents traceable to this cause do not happen, unless there is a special reason (*e.g.* digging deep with the needle). When gas embolism does occur, it is due to gas introduced from without—that is, under pressure. Exceptions I admit.

Let us pause here to consider certain other dangers connected with the operation. These may be tabulated as follows:—

I. *Shock or irritation reflex*—(a) as associated with every injury; (b) as a predominant symptom.

II. *Injury to the lung by puncture*, leading possibly to—(a) pneumothorax of the ordinary type; (b) hæmorrhage; (c) embolism (gas or clot).

III. *Injury to the lung by massive pressure* from excess of gas in intrapleural space—(a) undue pressure on structures of the lung directly compressed—(1) on alveoli, causing collapse of healthy tissue, and (2) on blood and lymph vessels, causing œdema of lung; (b) displacement of mediastinal contents; (c) pressure and loss of tonus of the other lung—a very important condition.

IV. *Inflammatory sequelæ to trauma of the tissue*—(a) pneumonia; (b) pleurisy, with or without effusion; (c) septic infection of neighbouring structures, mediastinal and parietal.

V. *Excitation of disease elsewhere*.—Here over-function of the other lung is referred to. This over-function has no resultant

ill effect if the septic cavities of the diseased lung are decreased in size, in which case both lungs are benefited.

From the experience gained in the Leeds hospitals I have come to believe that the mechanical danger of gas embolism has been much over-estimated and unduly emphasised by continental writers and too readily echoed by our own. Shock has seemed the commoner mischance. I am not at all certain that the reflex is necessarily a pleuro-vagal cardiac reflex; it has seemed to be abdominal also. Many cases have been followed by diarrhœa. In fact, shock is a central nervous exhaustion, and since the brain centres are disorganised, the shock is general. One lung injured may temporarily affect the other. The close connection between the tonus of the contents of the two cavities, thoracic and abdominal, only needs to be mentioned because it is so often forgotten. Abdominal tympanites in the later stages of pneumonia illustrates the relationship. The following experiment is of some interest:—At a post-mortem examination I tested the intrapleural pressure by penetrating the intrapleural space with a Saugman needle. The manometer registered a negative rise of $1\frac{1}{2}$ inches of water. I then opened the abdomen to a limited degree and tested the intestinal pressure with another needle and another manometer. This manometer showed a positive pressure of 2 inches of water—a positive fall. On freely puncturing the intestine and allowing gas to escape I observed an increase of negative pressure in the intrapleural space from $1\frac{1}{2}$ inches of water to $3\frac{1}{2}$ inches, while the positive pressure in the abdominal manometer disappeared. When I mentioned this matter to Dr. Gebbie he suggested a modification in the technique of artificial pneumothorax previous to operation—the use of an enema to empty the rectum, by which means hæmoptysis cases might also be relieved.

Brauer and Spengler have collected the records of many fatal cases. They are published in *Die Technik des künstlichen Pneumothorax (Erfahrungen und Ueberlegungen zur Lungenkollaps-therapie)*.

A few of these cases seem worthy of translation and epitome.

CASE XV.—Frau D. of B., 20th March 1908. During a refill the intrapleural pressure increased with remarkable rapidity. The patient complained of pain in the breast, screamed, and fainted. The pupils were dilated. The operation was stopped, and the patient quickly recovered.

27th March.—Refill. Manometer registration correct. Pressure

rose slowly to 40 mm. Hg, while 250 c.c. of nitrogen were introduced. Patient moved her arm on punctured side; operator had the impression that the needle had met with resistance deep down. Patient collapsed; pulseless, dilatation of pupils, ghastly colour, breathing apparently arrested, skin cold, corneal reflex abolished. Convulsions followed all over the body, and paralysis on the right side; involuntary micturition. She recovered partial consciousness on the 28th. The hemiplegia continued until death ended all on 31st March. No post-mortem. The suggestion is that death was due to gas embolism.

CASE XVI.—Frau F. of O. “We proceeded to a refill. . . . The needle met with evident resistance. . . . The manometer showed no deviation. The needle was moved slightly to and fro, and the above-mentioned feeling of resistance plainly continued.” A little nitrogen was allowed to pass in. It did so very slowly and under high pressure—20 mm. Hg. The patient collapsed and died immediately. No post-mortem. The comment is: “It is not possible to explain the death as heart-shock, as several minutes had passed since the needle had entered, and there was no pain. Besides, the patient had often undergone the treatment before.” The reasons given in the comment seem to me to be inconclusive.

CASE XVII.—Fräulein P. The patient was menstruating. A secondary puncture was being made when the patient suddenly died before gas had been forced in. During this operation a very slight movement of the manometer was noticed. The post-mortem showed that there was no intrapleural space where the needle had penetrated. The pleura was very thick. The right side of the heart was opened, then clipped, then put under water and the clip removed. Gas escaped. The left side of the heart was not opened. The brain arterioles did not contain gas. Effusion of blood round the wound in the lung was small. Brauer notes the comment of the doctors who made the post-mortem. The suggestion was that, with so much disease in the pleura, shock was unlikely, the pleura in this condition having little sensitiveness. It is suggested that nitrogen was sucked in from the needle and tube, thus causing gas embolism.

The following cases occurred in my practice:—

Patient was a male, aged 28, tall, greatly emaciated; febrile; pulse quick. Empyema suggested. The chest had been explored for fluid twice, and none had been found. Another exploration was done by me in hospital, when a few drops of pus were found. The needle, being small, was replaced by a larger one, and a more powerful aspirating apparatus was used. Suddenly the patient groaned and became unconscious; the pulse quickened from 110 to 140; the pupils became dilated, and the corneal reflex was abolished. As the patient seemed

to be dying, artificial respiration was adopted and stimulants were injected. Convulsions began. A well-marked Babinski was present on the right, an imperfect one on the left; both disappeared later. I could not discover a hemiplegia. The patient remained unconscious, and the convulsions became infrequent. Collapse was profound, sweats profuse, the temperature subnormal. If the German cases were cases of gas embolism, this was one. Yet no gas was injected. Is it possible that alveolar air, not under pressure, could have caused the convulsions? I think not. I judge the case to be one of shock in a man emaciated and in extreme prostration. The patient died in thirty-six hours.

A child, aged 10, had suffered from acute broncho-pneumonia, and was supposed to have pus in the chest. I was asked to see her, and I found serum. Directly after the rather slight amount of manipulation which had been required in the puncturing of the chest wall by a small aspiration syringe, the little patient became cyanosed and asphyxiated. The death was, in my opinion, due to shock affecting the tonus of both lungs.

Mrs. S., a patient with marked bilateral disease and hectic symptoms, was rapidly getting worse. Artificial pneumothorax was suggested and was attempted by me at the request of her doctor. The needle found the intra-pleural space, and the manometer registered a normal negative pressure and respiratory oscillations. Before any gas had been injected the oscillations ceased. As this was unusual and the patient very ill, the operation was postponed, and the patient sent back to bed. The next day she was very ill, but this did not attract remark, as her condition was not thought, either by her or by us, to be any worse than before the puncture. But on the second day she was very much worse, and sweating; the pulse was quicker and smaller, the left hand was swollen, and the left foot could not be raised from the bed as readily as the right. The paresis continued, but did not apparently get worse. In fact, the patient thought she could raise her foot on the fourth day with less effort. On the fifth day she died. She was conscious to the last. Post-mortem was unfortunately refused. The death was due, I thought (and her medical man agreed), to embolism, but probably to clot embolism. I had disturbed a lung in an extremely pathological condition, and a small clot or portion of debris had (probably subsequent to the puncture) entered the pulmonary circulation and reached an arteriole in the brain. Such a guess, and it could be no more, is at least justifiable.

Kate O'H., a woman of middle age, with bilateral disease, but not of a rapidly increasing type, had been treated by me with artificial pneumothorax. We came to a refill. The patient was well during the operation, and apparently well even the next day. On the third day she began with acute edema of the lung. She recovered. On looking back one could not see that there was any malign sign until the third day, and she had been seen twice daily by Dr. Clark. We

associated the acute oedema with the operation ; it was a post-operative result. There was no sign of any hemiplegia or indeed of any paretic symptom. This is two years ago, and she remains fairly well and able to do her house work.

Mr. L., aged 54, suffering from emphysema and chronic bronchitis, *i.e.* chronic oedema of the lung and bronchi with consequent right heart embarrassment. It was thought necessary to aspirate the base in which fluid had apparently formed. The needle had hardly been introduced when a most distressing attack of dyspnoea came on ; all the symptoms of acute oedema of the lung rapidly developed, and for some hours he was in danger. I vowed never to forget that the circulating—or perhaps the better word is vital—balance of the lung is easily upset.

Mr. ———, an old soldier who had suffered from malaria and pleurisy and had been discharged from the army as suffering from phthisis. He had softening at the left apex and fibrosis of the left base. I decided to attempt an artificial pneumothorax. I expected some difficulty ; still, I so frequently got in at the periphery of a dull area that I was not without hope of success. The injection of novocain and adrenalin was followed by exquisite pain ; more remarkable still, there was an acute pleurisy, which could scarcely be dissociated from the puncture. Brauer's remark that shock from puncture of the site of an old pleurisy was most unlikely would not have applied in the case of this man. There have been many similar cases. I think that the power of absorption is often lessened in the pleura when its sensitiveness is even increased. Still, I agree with Brauer to this extent, that the healthy pleura is usually more sensitive to pain and shock than is the diseased pleura, and that shock is more likely to follow injury to a healthy than to an unhealthy pleura. Let it be noted that we have not had any death at Armley or at Killingbeck that could be clearly ascribed to gas embolism, though the staff at these hospitals has operated more than 3000 times. I think I have shown that danger is ever present and that it may be due to many causes. Much attention must be given to the prevention of shock, and much care must be taken not to allow too massive an amount of gas in the pleura of a diseased lung. The operation needs to be done slowly, and a most careful watch must be kept for any sign of danger. The manner of doing this I shall now discuss.

The cases I have brought forward show the necessity—the prime necessity—of guarding against shock, that catastrophe which results so often from an apparently inadequate cause. Local anæsthesia is a necessity, general narcosis is not. Morphia is sometimes useful ; sometimes it causes nausea and cardiac irregularity. If given, it must be given on the day of operation—half an hour before. At one time I gave chloral as a routine drug the night before the puncture ; now I do not find it necessary. A

dose of urea hydrochloride and quinine is always injected around the site of the proposed puncture the night before the operation; this is repeated in the morning. On the morning of operation, after cleaning up with ether, I paint the skin with a solution of picric acid in spirit, gr. viii. to ʒi. Novocain is injected, first hypodermically and then deeply; the object is to anæsthetise the superficial and deep structures down to and including the pleura. In case the anæsthesia is not sufficient, ethyl chloride is sprayed on the part waiting for the needle. Morphia is always given if pain occurs with the operation.

The gas is always warmed. Nitrogen is almost always used—occasionally oxygen, occasionally air. The gas is sterile; the nitrogen is made by passing air through a strong solution of pyrogallate of soda and caustic soda. This strongly antiseptic solution is a guarantee for the sterility of the nitrogen. The gas in the nitrogen bottle is displaced by syphoning a perchloride of mercury solution into it.

In dealing with nervous patients, it is advisable to train them to familiarity with the operation by rehearsing it in parts. The first time the patient comes to the operating-couch the injection of novocain and the urea salt is probably enough. In a few days the operator may anæsthetise and freeze the part, and push the needle through the frozen plaque. Should he find the intra-pleural space he passes in, if all goes well, from 50 to 250 c.c. of gas. The first injection of gas must be done with some apprehension. The pressure of injection must be low—zero or slightly negative. The gas must be allowed to run in slowly. The tap of the needle must be opened at once, the gas apparatus being also shut off, if pain or any other untoward symptom is observed. The opening of the side tap to the needle relieves the discomfort caused by a too rapid induction.

But before a particle of gas is injected the manometer must give the signal of safety. The manometer we use is simple; it is on the principle of a baby's feeding bottle. (If the baby sucks, the fluid rises; if the baby coughs, the positive pressure drives the milk down, emptying the tube.) The manometer is switched on to the indiarubber tube leading from the bottle containing the gas to the needle which carries it into the intrapleural space. Now for the manometer indications. As the needle eye reaches the intrapleural space, this space, under negative pressure, sucks up the fluid in the inner tube of the manometer. The usual negative or suction pressure is 3 inches. When one sees this jump in the manometer tube, one knows that the intrapleural space is reached. Then one

looks for the respiratory oscillations in the fluid column. If one gets both the initial rise and the oscillations, all is well.* But all is not well if the needle eye is blocked (by blood, fat particles, etc.). All is not well if the needle moves and penetrates the lung, or slips out of the intrapleural space into other structures. Therefore the manometer column is watched for a few seconds, and if the negative pressure and the oscillations continue the gas bottle is opened and the gas is allowed to enter slowly. As this takes place, the pressure in the pleura increases; the important point is to see that it does not increase too rapidly, and to watch for any disappearance of the oscillations. If there is any doubt about the pressure, shut off the gas and open the needle tap.

This gives the happenings in a straightforward case. If, however, there is no manometer movement, the needle eye may be (*a*) still in the superficial tissues external to the pleura, (*b*) in the pleural membrane or adhesions, (*c*) in the lung tissues, (*d*) in a bronchus, (*e*) in a cavity, or (*f*) it may be blocked by blood, serum, or enfolding lung surface.

If the needle point is between the thoracic fascia and the external pleura, there may be an imperfect manometric rise. The rise and the oscillations will be alike small. There seems to be little danger if by mistaking the position you allow a little gas to get in here. Soon the pressure stops the flow.

If the needle eye is in the lung tissue there may, as has been said, be no manometric movement, or there may be a slight one, generally in the direction of the positive fall, but at any rate a slight oscillation around the zero or normal water level.

If the needle has canalised a vein—and this has apparently occurred in my work several times—the pressure becomes positive; the manometer level drops, sometimes suddenly, and even to 2 inches. In the cases I have seen there has been no oscillation. Blood flows at the same time into the needle, and may clot there or flow beyond into the indiarubber tube attached to the needle, and be seen in the observation chamber fitted into this tube. Sangman tests for blood with his suction syringe. Dr. Clark introduced the method of probing with the stylet attached to the needle. The stylet, which was originally used to clear clots, takes the stain of blood if any is present; and Clark, wiping the stylet on a white towel, was able to detect hæmorrhage in the pleura.

* This statement refers only to primary puncture. Positive pressure in a refill, when there has not been complete absorption of gas, may be a relic of positive pressure at the last induction.

In one case I attempted an artificial pneumothorax in the presence of two medical men. It was a case of bilateral disease. I reached, as I thought, the pleural cavity. There was a small rise— $\frac{1}{4}$ inch—and the same oscillation. We felt that the signals were not with us, and we decided that it was not wise to inject any gas. If, owing to the desperate condition of the patient, we had attempted to pass the signals, we should have kept in mind the possibility that we were in the lung structure; we should have proceeded slowly with intermittent small gas injections and at a low pressure, and we should have used oxygen.

All the manometer signs of safety may prove deceptive in these advanced cases; for instance, a clot may be mobilised; a patient may be directly asphyxiated, or may be so ill that even an amount of pleural reflex which would under ordinary circumstances have no malign effect may kill.

Yet certain cases, only to be mentioned briefly, call for a suspension of judgment in those who believe that no risks should be run:—

Emily J., bilateral disease, sputum \bar{v} viii. daily, much cavitation, fever, emaciation. A hopeless case, bedridden, a woman of mild passive courage. Artificial pneumothorax was cautiously attempted. Auricular fibrillation was brought about by the first injection, but the treatment was continued. The patient rapidly improved and was able to get out and to live a comfortable invalid life. Empyema occurred $2\frac{1}{2}$ years after the beginning of treatment, and the patient died. A post-mortem examination showed a lung contracted by treatment to the size of two ordinary fists, and looking like a piece of leather. The other lung showed consolidation in one-half of its extent.

Mr. B., large cavity in the right lung, some cavitation in the left. Patient's symptoms and signs left no hope for him. Sputum \bar{x} xiii. daily, T.B. + +; operation. After several gas inductions the patient was remarkably improved. It is sufficient to say that the sputum fell to \bar{v} iv. daily. After apparent success there was a relapse and severe hæmoptysis. Treatment was persevered in, and eventually paraffin was injected together with the gas— \bar{v} ii. of paraffin each time until the patient had had a pint. Three years ago the patient was supposed to be dying; the friends arranged that someone should be by his bedside night and day so that one of them should close his eyes. This week a friend (?) is taking him for a motor tour. The patient is not cured—he cannot be—but he is living a clean life, whereas he was dying a putrid death.

I had suggested the use of paraffin to Saugman some time before I injected it in B.'s case; he approved the idea, which was

new to him. I am not aware of any other operator having used this form of treatment. I frequently put in paraffin in chronic cases after a well-marked gas filling; it is not readily absorbed; it creates fresh serous effusion; the pleura is eventually greatly thickened, and obliteration of the pleural cavity may follow. The relief has always seemed proportionate to the thickening of the pleura. Of course this thickening of the pleura may not be the direct cause, but only an indication that a pathological condition had become associated with the formation of fibrous tissue in and around the diseased area, an evidence of that process which hinders the spread of the disease. It is still necessary to go on injecting gas until the course is at an end. After the use of petroleum it is impossible to get into the base.

There are many cases which must not be subjected to operation. This paper is already too long and should not be further lengthened, yet the following condensed notes may be useful:—

Miss G., good social position, unilateral disease slowly increasing. Operation only done after nine months' hygiene treatment had failed.

Samuel F., physical signs not marked on ordinary examination. X-ray showed universal mottling. Dyspnoea marked on exertion. Operation refused.

A. L., asthmatic, with T.B. in sputum. Operation refused. I have known alarming symptoms of tachycardia follow operation on an asthmatic.

H. L., slight disease. Operation done unusually rapidly. Great distress, dyspnoea, lividity.

Annie T., bilateral disease, emaciation, poor physique, half starved. No operation until general condition improved, with hope of further improvement.

Hiram H., violent hæmoptysis, serious collapse. Artificial pneumothorax induced, all risks taken.

I think the real benefit caused by artificial pneumothorax is that an acute case becomes subacute under treatment, and a subacute case chronic. The amount of fibrous tissue formation around and beyond the diseased focus is increased. The successful cases are those in which the pleura becomes thickened. Even where it is impossible to compress the lung, benefit has often seemed to me to follow the attempt to get air in—that is, has followed traumatic irritation of the pleura. It is true that immediate improvement follows the compression and partial closure of the cavity, but our significant and striking cases are those in which undoubted thickening of the pleura has followed the treatment.

CLINICAL NOTES ON THE RADIOGRAPHY OF THE
THORAX IN CHILDREN.

By J. S. FOWLER.

I.

THE value of radiography in the clinical diagnosis of lung disease in children is probably not sufficiently widely recognised. From considerable experience during the past few years I have been led to place a great deal of reliance on it, and do not now feel justified in forming a positive conclusion in a doubtful case, even when ordinary physical signs are absent, without an X-ray examination. For various reasons screening is unsatisfactory in dealing with children; a radiograph should be made, and the appearances compared with the physical signs. There is seldom difficulty in persuading the patient to lie still during the comparatively short exposure, but in some cases an anæsthetic is required.

The interpretation of radiographs is at first a matter of some difficulty, and it is only after the experience acquired by comparing numbers of plates that facility is gained. Unfortunately, the finer changes are ill shown in half-tone blocks, hence reproductions are of limited value. As a rule the changes seen in the plates agree with, or at least do not contradict, the physical signs. Frequently they are much more marked than the signs lead one to anticipate; the reverse of this—marked physical signs with few radiographic findings—is much more rare. The following cases have been chosen as illustrating the usefulness of this method of diagnosis. The radiographs are in all cases the work of Dr. Spence, to whose skill and assistance I am greatly indebted.

I. MILIARY TUBERCULOSIS OF THE LUNGS.

As is well known, the clinical recognition of miliary tuberculosis in children is often by no means an easy matter. The physical signs of pulmonary mischief may be trifling or even absent for a considerable time, and the early stages of the malady are in most cases indistinguishable by ordinary methods. The radiographic picture is, however, extremely characteristic, and affords, probably, the earliest means of arriving at a correct diagnosis.

CASE I.—*Clinical Symptoms and Signs of Miliary Tuberculosis Well Marked; Confirmed on Post-mortem Examination. Characteristic Radiograph.*

Cissy M., aged three years, admitted 8th January 1915, complaining of "dwining."

Family History.—Satisfactory; no history of exposure to the infection of tubercle.

Previous Health.—Small child at birth; fed on Nestlé's milk, and after third month gruel in addition. Teeth at 9 months; walked at 10 months. Attack of diarrhoea at 6 months, and suppurating gland (? tuberculous) in neck at 1 year. Since then quite healthy until 6 weeks ago, when *present illness* began. She began to waste, became languid, and lost her appetite; had occasional diarrhoea, and has lost flesh rapidly for the last three weeks. She complains of no pain, but has been confined to bed through weakness for about three weeks.

Condition on Examination.—Emaciated, unhealthy-looking child, weighing 16 lbs. 4 ozs. Temperature, 100°; pulse, 136; respirations, 40. Skin harsh and dry; moderate rickets. *Abdomen* markedly distended, walls thin and relaxed, no tenderness or resistance on palpation. Liver $1\frac{1}{4}$ ins. below costal margin; spleen enlarged, two fingers-breadth below ribs. No tumour or free fluid in abdomen.

Respiratory System.—Chest moves freely on respiration. No cough. Apex beat in 4th space within nipple line. Vesicular, somewhat harsh breathing over whole chest, with numerous crepitations and a few high-pitched rhonchi. No alteration of note.

Leucocytes, 16,000; urine, normal; von Pirquet, positive.

After admission the child steadily went down hill; her temperature remained high, and she died on 1st February, without the development of any further symptoms. On post-mortem examination there was found to be generalised miliary tuberculosis affecting the meninges and thoracic and abdominal organs; there was also a patch of tuberculous broncho-pneumonia at the base of the left lung.

In this case the diagnosis was almost self-evident apart from the radiograph (Fig. 1), taken a few days after admission, which shows the mottled shadows so characteristic of miliary tuberculosis as almost to merit the adjective pathognomonic.

CASE II.—*Serous Pleurisy; Tests for Tuberculosis Negative; Apparent Recovery. Some Months later Debility and Loss of Flesh; no Physical Signs; Radiographic Appearances of Tubercle; Development of Signs of Tuberculous Peritonitis; Downward Progress.*

Margaret W., aged 11 years, admitted 19th July 1913, complaining of wasting for 2 months.

Family History.—Good; no evidence of exposure to tubercle. Healthy at birth, breast-fed till 10th month. Teeth at 1 year; walked at 18 months. Has had measles, whooping-cough, chicken-pox, and

German measles, but apart from these has had no troubles until the *present illness*. Two months ago she began to cough, and complained of breathlessness on the slightest exertion; cough is now less, but she is thinner and very easily tired. On examination she is a thin, though healthy-looking child, not acutely ill.

Respiratory System.—There is dulness all over the left side of the chest; the breath sounds are diminished over the dull area; the apex beat is displaced inwards to a slight extent. There were no abnormal signs in any of the other systems. Von Pirquet's test not applied. A syringe-full of clear fluid was withdrawn from the pleural cavity. Dr. Carnegie Dickson reported as follows:—"Films: chiefly fibrin and a few red blood corpuscles. No definite inflammatory cells or organisms found. Cultures: agar and serum; no growth. A further sample of the exudate was examined at the College of Physicians' Laboratory, and a guinea-pig was inoculated on the 22nd July. No tubercle bacilli were found in the films, and the guinea-pig, killed and examined forty days after examination, showed no sign whatever of tuberculosis.

The patient was in hospital at this time for three and a half weeks, and the fluid became absorbed entirely without tapping being necessary. Her temperature was normal throughout her stay in the ward, and she gained three and a half pounds during the last fortnight. She was discharged to the convalescent home at Gullane on 15th August, the only abnormality in her chest being a slight trace of dulness at the base of the affected lung. The *diagnosis* was serous pleurisy, non-tuberculous. No radiograph of her chest was made at this time.

She was readmitted to the ward four months later—on 19th December 1913—complaining of pain in the stomach of 4 weeks' duration. She had left Gullane on 22nd September in good health, eating well, and with no cough. She went back to school, but soon began to complain of feeling very tired, and about the middle of October began to cough again. In November the pain in the stomach began to trouble her; she got thinner, was unable to go to school, and became listless and disinclined to play. After she had been attending the outpatient department for five weeks she was sent into the ward, as she was making no progress.

State on Examination.—Fairly well nourished, and does not look ill; she is a pound lighter than in August. *Abdomen* moves freely; no tenderness, resistance, tumour, or fluid. There is no distension.

Respiratory System.—No cough; no dyspnoea. Respirations, 20 to 24. There is no alteration of the percussion-note in any part of the chest. The breath sounds are vesicular everywhere, without accompaniments, the only alteration is that at the apices they are possibly a little harsher than normal.

Circulatory, urinary, and nervous systems show nothing abnormal. Temperature is normal; von Pirquet, positive.

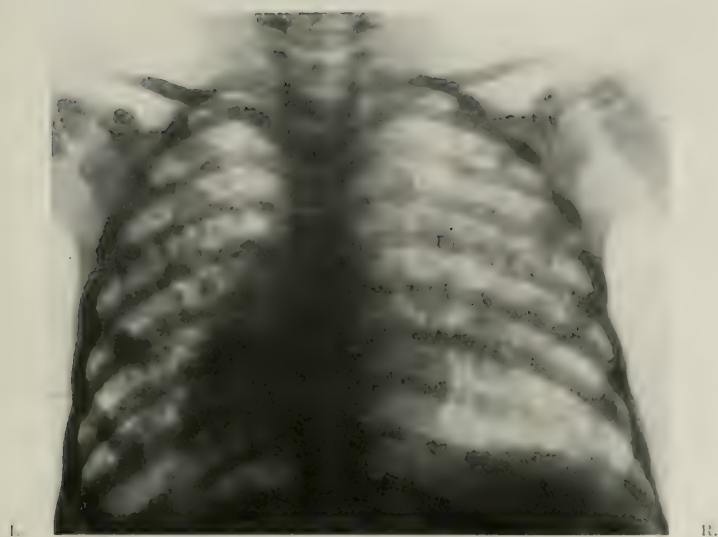


FIG. 1.—Mottled Appearance Characteristic of Miliary Tuberculosis.

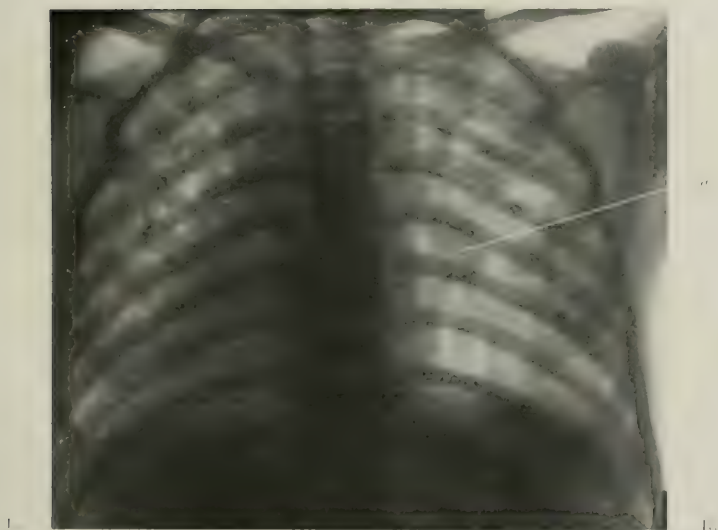


FIG. 2.—Mottled Appearance Characteristic of Miliary Tuberculosis ;
Enlarged Bronchovascular Circulation.

As there was very little to go upon in the way of making a diagnosis, a radiograph of the chest was taken, and rather to our surprise showed very extensive miliary tuberculosis (Fig. 2). It is noted in the case record that the "condition of the child does not tally with the X-ray; there is no definite change in the chest; child is up every day."

4th January.—Slight pyrexia during the past few days for the first time since admission.

7th January.—Temperature still raised. The abdomen has become very much distended, tense, and difficult to palpate.

10th January.—Temperature is lower; abdomen less distended, but still doughy. Has lost two pounds during the past week.

From this time onwards the child showed the clinical features of an ordinary case of abdominal tuberculosis. She was kept in hospital until the middle of April, during which time she underwent no material change for the better. Her temperature fluctuated a good deal, and her abdomen always remained somewhat distended, tense, and doughy. A second radiograph, taken two months after the first, showed slightly more mottling than the previous one, but during her whole stay in hospital it was not possible to make out any more definite changes in the physical signs in the chest than a slight degree of harshness of the vesicular breath sound at the right apex—a sign on which little reliance can be placed. She received one injection of Béraneck's tuberculin ($\frac{1}{20}$ c.c. of dilution A/1024), but it produced a very marked reaction and was not repeated.

After leaving hospital she attended at the out-patient department for some time, but was going down hill, and when inquiries were made about her a few months later she could not be traced.

In this case the radiographic examination gave the first definite proof that the child was suffering from anything more serious than debility, and the subsequent course of the illness confirmed the accuracy of the radiographic diagnosis. It is not necessary to multiply examples, but the following case may be shortly quoted:—

CASE III.—Brother of Case I.—Brought because the Parents feared he was "going the same way" as his Sister—Physical Examination Indefinite; Radiograph Positive.

Robert M., aged 5 years, admitted 10th February 1915, because he had "taken ill in the same way as his sister did." A healthy child up till December 1914, when he began to fail, and got thinner. No definite symptoms other than these.

State on Examination.—Pulse, 120; respirations, 28; temperature 98°; weight, 28 lbs. 4 ozs. Rather delicate looking, but fairly well

nourished. No signs of old rickets. Tonsillar glands enlarged. *Abdomen* moves freely; nothing abnormal to be made out.

Respiratory System.—The only abnormality is that at the left base the breath sounds are not quite so clearly heard as on the right; there are a few tough râles on inspiration. Percussion unimpaired.

Other Systems.—Nothing of moment.

The X-ray photograph, however, showed fine mottling throughout the chest—appearance very similar to Figs. 1 and 2—and a larger shadow in the left scapular region.

The patient remained in much the same condition for some three weeks, when his temperature suddenly rose (it had previously been normal) and assumed a remittent type. He began to waste rapidly, but no further signs developed in the chest. A second radiograph, taken 5 weeks after the first, showed a very much more dense mottling, indicating progress of the disease. As there seemed no prospect of improvement, the child was sent home at his parents' desire.

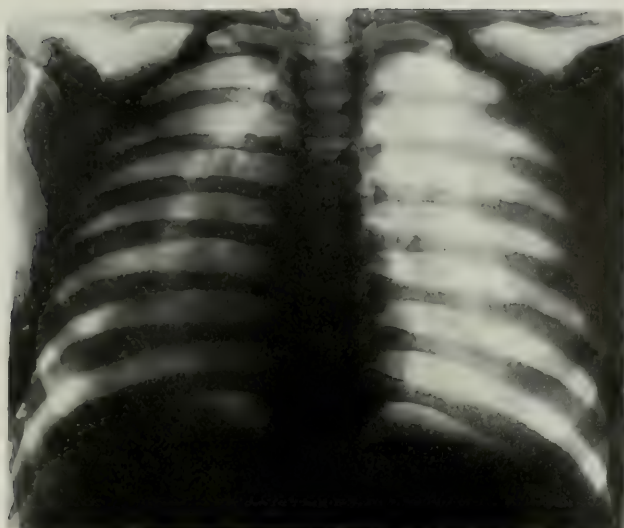
II. PLEURAL EXUDATES.

Exudates into the pleural cavity give rise to a well-marked uniform shadow, of greater or less density according to circumstances, and often showing a fairly well-defined margin. Intrapulmonary lesions may also give rise to the same appearance, but as a rule the shadow is less uniform. Very much the same appearance is produced by serous exudates, by pus, and by lymph, although the shadow produced by a serous effusion is less dense than that of pus or lymph. Naturally, radiography is of less practical importance in the diagnosis of pleural lesions, for the recognition of which more direct methods are at hand than in miliary tubercle, yet it is often useful. The following case affords an example of this. It is not unlikely that the condition would have remained undiagnosed but for the help of radiographs.

CASE I.—Patient Admitted with Symptoms Suggestive of Meningitis: Lumbar Puncture Negative—Pyrexia for Three Weeks, then Recovery—Radiograph on Eleventh Day showed Chest Lesion; No Pulmonary Symptoms, and Physical Signs Indefinite and Transitory.

Maggie T., aged 9, admitted 2nd February 1915, complaining of vomiting and pain in the head, of a week's duration.

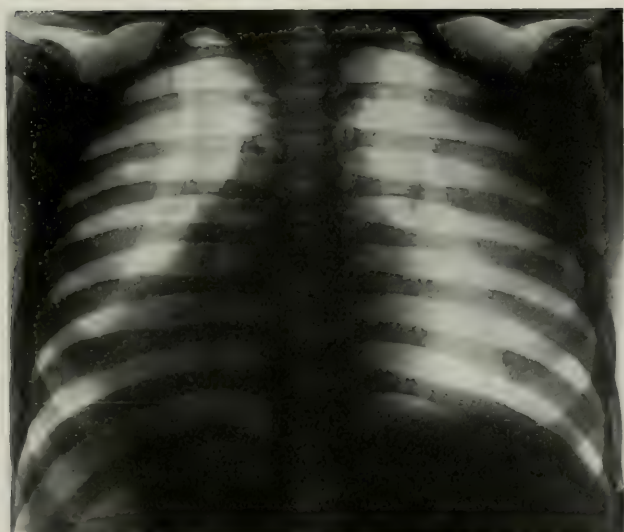
Family and previous history unimportant. Present illness began on 23rd January with vomiting and headache, which gradually improved for two days, and then became much worse. On the 26th and 27th she seemed very ill, crying out with pain, vomiting, and being very restless. Bowels acting regularly. On the 31st she seemed feverish, and complained of sore throat; her headache and vomiting continued



L.

R.

FIG. 3. Pleurisy. 13th February 1915.



L.

R.

FIG. 4. Same Patient, after Recovery. 25th February 1915.

without intermission, and noise seemed to aggravate the pain. She was treated by a doctor, who sent her into hospital on the suspicion that she might be developing meningitis.

State on Examination.—Child is obviously ill and has an anxious expression; she lies curled up in bed on the left side, but occasionally stretches her limbs out straight. She is well developed and nourished; there is no head retraction, but her neck is rigid, and she resents having her head moved. Thorax is normal. *Abdomen* somewhat retracted, and on palpation there is marked resistance of the whole upper half of the abdominal wall, and the child complains of pain in the epigastrium. Spleen not palpable.

Child is very irritable and dislikes being handled; she complains constantly of frontal headache and epigastric pain, and is inclined to be drowsy. Temperature, 102°; respirations, 26; pulse, 116.

Respiratory System.—Movements good; no impairment of note; vesicular breathing all over; no cough or movement of *alae nasi*.

Circulatory System.—Heart, normal; pulse, regular; vessel appears contracted, and expansion is small.

Urinary System.—No albumin or pus; ferric chloride reaction well marked.

Nervous System.—Kernig's sign is present, otherwise nothing to note.

Progress.—3rd February.—Much the same; still drowsy and irritable, and complaining of headache. Lumbar puncture: cerebro-spinal fluid normal. Leucocytes, 5800.

12th February.—Since last note, has improved and the head symptoms have gone. Temperature still remains up. Leucocytes, 7600; there is nothing to account for the temperature so far as physical signs go.

13th February.—A radiograph shows a shadow over much of left lung (Fig. 3). A careful physical examination of the chest was made in view of the radiographic finding, but revealed very little. There was a small zone of doubtful impairment on the left side anteriorly near the cardiac dulness, and the vocal resonance was less on the left than on the right side. The breath sounds were nowhere abnormal. The respirations were from 20 to 24; there was neither cough nor respiratory distress.

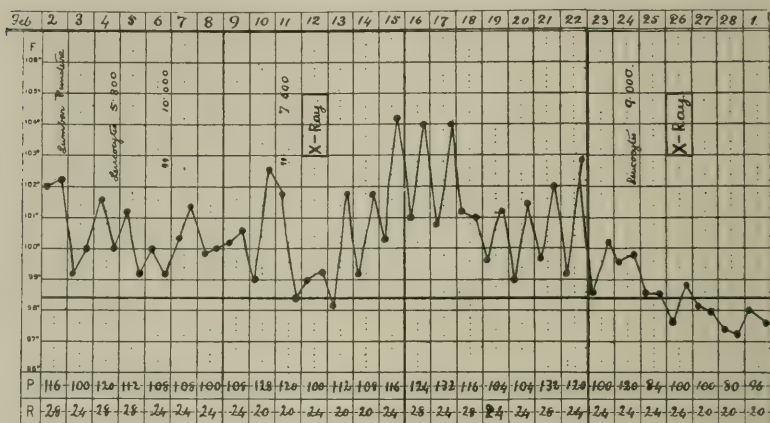
18th February.—Since last note the temperature has been rising gradually (see chart), and there is a slight increase in the physical signs. There is some impairment in the left lower axilla, and the breath sounds are faint, with creaking accompaniments (? friction). The vocal resonance is everywhere unaltered. No cough, no quick breathing.

23rd February.—The temperature is falling and the child is better; the above physical signs have disappeared.

25th February.—Radiograph to-day shows nothing abnormal (Fig. 4).

12th March.—Temperature has remained down; discharged cured.

The *diagnosis* in the above case was pleurisy, with an exudation of lymph over a considerable part of the left lung. It is difficult to say why there were not more physical signs of the condition, but the presumption is that the layer of exudate was



comparatively thin. Doubtless the epigastric pain and tenderness complained of early in the illness were due to implication of the pleura, but although the fever was considerable, the low leucocyte count and the complete absence of chest symptoms show that the process was not a very acute one. From the dearth of positive signs the case was puzzling; the radiograph was made only when other means of arriving at a diagnosis had failed, and the appearance of the left lung came as a complete surprise.

AN ANALYSIS OF SIXTEEN CASES OF CHOREA AND MOTOR TIC.

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IN the present paper the term "chorea" is used to connote the presence of sudden inco-ordinated and involuntary movements of a purposeless character, partial or generalised in their distribution, and which cease during sleep. Although the majority of the cases quoted belong to the classical type of Sydenham, others, whilst presenting an identical group of symptoms, differ from them chiefly in their chronicity. Similarly, the cases of motor tic are included because there are sound reasons for considering them in this connection. It is a matter of common observation, for instance, that a motor tic affecting single muscles or groups of muscles is not uncommonly left as a vestigial affection after an attack of chorea. Case III. (M. R.) is an instance of this. Moreover, the muscular contractions occurring in chorea are found to vary in intensity within the widest limits, ranging from the merest twitching of individual muscles (as in Case II., A. H.) to the most violent jactitations of the whole body (Case XII.), so that a case of typical chorea often passes insensibly into one of motor tic. The fact, too, that motor disorders, whether choreiform, athetoid, or rhythmical, are so frequently found in conjunction, and on an identical pathological basis, constitutes an *a priori* ground for considering them together.

As to the type of material dealt with in this paper, it is necessary to state that 13 of the series occurred either in association with amentia or in near relatives of aments, the other 3 being of the class met with in ordinary practice. The former group comprised the total number encountered during the routine examination of 80 consecutive cases of amentia of all degrees. It is important to bear this in mind when we come later to the question of etiology. Of the total number of cases described only a comparatively small number came under actual observation during the attack, but were elicited during an inquiry into the family history. Of the cases so obtained details are necessarily meagre, but were sufficient to satisfy one as to the nature of the complaint. Finally, of the 16 patients described, 10 were examples of acute chorea, 2 of chronic chorea, and 4 of motor tic.

The following is a brief summary of the cases :—

(A) *Acute Chorea.*

CASE I.—E. S., age of onset 17. Duration of illness about 4½ months.

Family History.—Was one of 6 children; father was an epileptic, mother died of pulmonary tuberculosis.

Medical History.—No history of rheumatism or previous attacks of chorea.

Condition When First Seen.—A thin, anæmic girl. She showed constant choreiform movements of left arm and leg, and twitching and grimacing of the left side of the face. She had to hold her left arm forcibly to restrain the movements—could not hold things with it, or feed herself. The left foot was dragged in walking, and the disorder was markedly increased during voluntary movements. The symptoms ceased during sleep and were increased during observation. There was no change in the affective mental condition, except a slight irritability. Examination of the heart revealed a soft systolic bruit (probably hæmic) heard in all the cardiac areas, and not conducted into the axilla; there was no temperature, and no arthritic or other manifestations of rheumatism. The symptoms set in about ten days after a severe fright. Going downstairs during the night she saw a moving object which she imagined to be a burglar, but which turned out to be only a cat. She was much startled by the occurrence, but apart from the mental shock appeared to be none the worse for some time. Subsequently movements began in the arm, spread to the leg, and lastly to the face.

Course and Treatment.—First seen six weeks after onset. Treatment was carried out by hypnotic suggestion. Later, she was put on a course of Bland's pills. It was noticed during the first sitting that the movements were much less during hypnosis, but returned in full force immediately after waking. After a few sittings the movements entirely ceased during the actual "sleep." She was seen altogether about eight times, at intervals of about a week, at the end of which period she was sufficiently well to return to work. Improvement was first noticed in the face muscles, later in the arm, and last of all in the leg. At one period in the treatment there was a slight involvement of the right arm, which, however, never came to anything. The exciting cause in this case was undoubtedly the psychic trauma acting on an unstable nervous system. The girl had previously been in excellent health, and the anæmia was probably secondary to the chorea. Moreover, she was well on the road to recovery before the administration of iron was commenced.

I have dealt with this case at some length as it illustrates the part played by inherent neuronic instability, and is an

instance of chorea being set up by mental trauma and yielding to mental therapy.

CASE II.—A. H., age of onset $7\frac{3}{4}$ years. Duration of acute symptoms about one month, though movements were still present two months after onset.

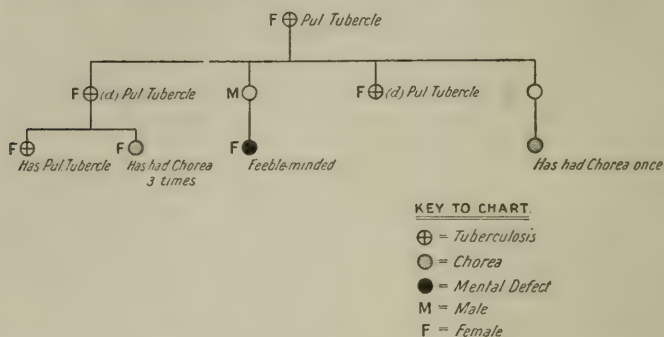
Family History.—He is one of two children. The other died after burns. Cousin on father's side is a mental defective and attends a special school. Another cousin in the same family has pulmonary tuberculosis. Father somewhat addicted to alcohol.

Description and Course.—When first seen had severe pain and swelling of knee- and finger-joints with fever. In addition, there was a systolic bruit heard in all cardiac areas, but loudest in mitral area, and not propagated into axilla. There was also a short diastolic bruit heard in mitral area. No displacement of apex beat or increase in area of cardiac dullness. Patient was very anæmic, and choreic twitching of mouth, lips, head, and fingers was noticed. Isolated muscles or groups of muscles appeared to be affected, especially the corrugator supercilii, occipito-frontalis, and levator and depressor anguli oris in the face. In the hand the lumbricales and interossei were involved, and all the movements were increased during speech or on attempting to move. All superficial reflexes (including cremasteric and plantar) were much increased. Salicylates were administered and the acute symptoms subsided. The intensity of the movements varied directly with the temperature, but persisted to some extent after all acute symptoms had disappeared, as did also the cardiac bruit. It should be mentioned that the choreiform movements preceded the onset of the rheumatism by several weeks, and were then thought to be due to habit. At the present time, 3 months after onset, patient has a healthy complexion, and the twitching of the muscles of expression is barely discernible.

CASE III.—M. R., age of onset 7 years. Duration of attack about 10 months. Movements began in hands and spread to legs and involved both sides of the body. Confined to bed for two weeks. Present time (3 years after attack) he still has a slight twitching of the orbicularis palpebrarum, and marked paresis of upper extremities, both of which are said to date from attack of chorea. The paresis of the hands is so marked as seriously to interfere with his ability to write or do work requiring much manipulative skill. He is anæmic, but shows no signs of valvular disease of the heart. Has recently had two epileptic seizures—one a typical major attack with loss of consciousness, and the other Jacksonian in type.

Family History.—Only child. No neuropathic ancestry. Mother's sister died of pulmonary tuberculosis. Mother's mother has rheumatism.

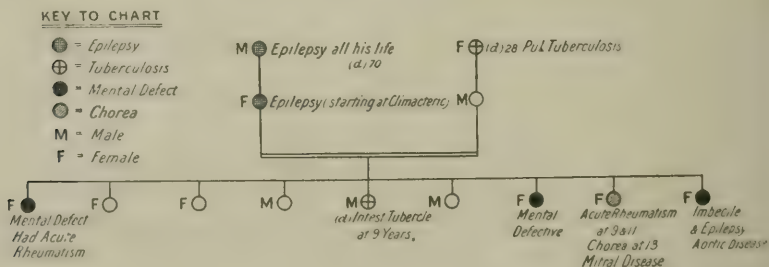
CASES IV. AND V. were both examples of acute chorea occurring in the relatives of an ament. The relationship in this case was that of cousin, and the conjunction of amentia, chorea, and tuberculosis in the genealogy appended is particularly to be noted.



CASE VI.—F. N., æt. 19. Had acute chorea at the age of 7 years, lasting 7 months. He is a feeble-minded youth and suffers from epilepsy. Fits began at 11½ years of age after a fall. Said to have been mentally bright before that. Now very much demented. Heart normal.

Family History.—Paternal grandfather was “paralysed” for 30 years. Mother and maternal grandmother had rheumatism, and the latter “died of dropsy.” Maternal aunt is in an asylum. A brother of the patient is addicted to alcohol. A sister is delicate and “tuberculous,” and another brother did not talk until the age of 3.

CASE VII.—Acute chorea occurring at age of 13, after two attacks of acute rheumatism at the ages of 9 and 11 respectively. The affection lasted 9 months, and at present she has mitral disease. This girl has 3 sisters who are mentally defective, as shown in table appended.



It is to be noted that the chorea occurred in a member of the family who showed no mental defect, but in whom the neurotic predisposition was probably latent.

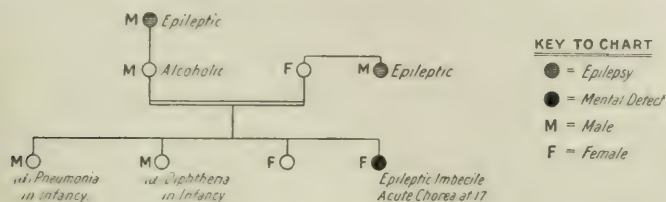
CASE VIII.—M. R. Acute chorea in a mental defective, *æt.* 15. Had chorea at age of 12, and was at home from school nearly a year. Said to have had a "rheumatic heart."

Present Condition.—A feeble-minded girl with small cranium and low bulging forehead. Exhibits erotic tendencies. Is myopic and has right internal strabismus. Reflexes (superficial and deep) very sluggish. Heart sounds normal.

Family History.—Father was charged with attempted suicide, otherwise no neurosis.

CASE IX.—I. C., acute chorea in an epileptic imbecile, *æt.* 17. No information as to attack.

Present Condition.—Has both major and minor fits. The former are infrequent and affect chiefly the right side. Has marked paresis of right leg below the knee, and drags right foot. Neurotic heredity shown in accompanying table.



CASE X.—P. B., acute chorea in the sister of an epileptic idiot. No particulars. The child herself is almost completely paralysed in the lower extremities. Cannot stand or walk, or sit erect. She is unable to do anything for herself, and her mental status is that of an infant.

(B) Chronic Chorea.

CASE XI.—A. E. S., *æt.* 13. Chronic chorea of 10 years' duration occurring in an imbecile. At the age of 2½ years she had a fall and injured her head. Was unconscious for a short time; subsequently developed a squint, and later chorea. Since then has deteriorated mentally.

Present Condition.—Exhibits constant choreic movements affecting the whole of the body. It is to be noted that the chorea only shows in the lower extremities when patient is sitting. There is some paresis of upper extremities, and grasp of hands is weak. The movements are extremely rapid, as is also her speech. In her conversation there is a certain resemblance to the "flight of ideas" seen in a case of mania, except that the flow of words is not so rapid. She talks incessantly—a good deal of it is nonsense—but some of her remarks are pertinent and relate to other people's conversation, here again resembling mania. Her speech is very imperfect and difficult to under-

stand and almost as "choreic" as her movements. Though apparently inattentive, her conversation is automatically directed by whatever strikes her attention. She is very small for her age—no doubt owing to her constant restlessness—but shows no evidence of disease apart from that described.

Family History.—Maternal cousin died from spinal affection, nature unknown. Otherwise no neurosis, no stigmata of degeneration, and physiological development proceeded on normal lines.

In this case both the amentia and the choreic affection were secondary to the fall in infancy. What the actual lesion may have been it is impossible to surmise, but in view of the mental defect and the generalised distribution of the chorea, it is highly probable that an inflammatory or vascular lesion of the cortex occurring at the time of the injury, acting as a permanent irritant, has induced an instability of the cortical motor neurones on the one hand, and an involution of the cells of the prefrontal region on the other.

CASE XII.—H. B., æt. 14. "Chorea spastica," dating from birth, and involving the greater part of the body.

History.—This was an example of birth palsy (spastic diplegia). Patient was an eight months' child. Parturition was difficult, and child was said to be blue for some days after birth. Head is still much deformed; the moulding of the cranium is permanent and like that seen in an unreduced brow-presentation, viz. a high, precipitous forehead, sloping back sharply to the occiput. Physiological development delayed—has never walked and did not talk until $3\frac{1}{2}$ years of age.

Present Condition.—He is grossly deformed, very big for his age, and well developed physically. The left leg is contracted, left arm and hand much contracted, and finger-joints hyperextended. Right arm still more deformed, and fingers are bent into the palm of the hand. Sight and hearing normal. Pupils equal; react to light and accommodation. He sits habitually with the left leg thrown over the right and the right hand held between the legs to restrain the violence of the choreic movements, which affect the left leg and right arm the most. The movements are violent, and involve the head and the whole of the left side, and, to a certain extent, the right arm. The contractions of the limbs are evidently spastic in nature, and any attempt to separate them or extend the joints is attended by a marked exaggeration of the choreic movements, so extreme as to throw him out of his chair. He cannot pick up or hold anything with his hands, of course, and cannot stand alone. He habitually uses his tongue to turn over the leaves of a book, and can seize and swallow his food off

the ground very much as a dog does. By dint of this extraordinary use of the tongue it is greatly hypertrophied and wrinkled (macro-glossia). Both superficial and deep (tendon) reflexes are absent. His education has of course suffered considerably, though his mental condition is very fair considering his opportunities. Speech is staccato and explosive, but quite intelligible. Though described by the Education Authorities as mentally enfeebled, the defect is largely secondary to the physical disability and lack of education.

(C.) *Motor Tic.*

CASE XIII.—G. D. M., *et.* 9. Motor tic occurring in an imbecile (secondary ament).

History.—Affection dates from infancy. At $1\frac{3}{4}$ years of age she had pneumonia and meningitis. Subsequently there was paralysis of the left side, from which she has only partially recovered. In addition to the weakness of the left side the child was noticed to be dull mentally, and has never made headway. Movements commenced later in the left arm, and have continued up to the present time. No neurosis in family, and no stigmata of degeneracy.

Present Condition.—Has marked paresis of the left arm and leg, and walks with a decided limp, pressing on right side. Has constant rhythmic movements of the left arm and hand, in which she alternately grips the right hand and then relaxes her hold. Occasionally when her attention is excited the movements cease, and also during sleep. Has left internal strabismus and slight scoliosis. Patellar reflex present—increased on left side. Also has frequent attacks in which she falls to the ground, and which resemble epilepsy of the Jacksonian type. Mentally she is an imbecile of a low grade, cannot talk or feed or dress herself, and is quite incapable of education. The amentia, hemiplegia, and motor tic are all sequential to the attack of meningitis occurring in infancy.

CASE XIV.—C. E., *et.* 9. Motor tic occurring in an idiot (primary ament).

Family History.—A sister had "paralysis" at $13\frac{1}{2}$, and suffered from some form of tonic spasms of the left arm—both of them probably hysterical in nature. A brother died in a fit at $2\frac{1}{2}$ years. The mother stammers occasionally, and has a motor tic affecting eyelids on both sides. Physiological development much delayed.

Present Condition.—He exhibits constant clonic contractions of orbicularis palpebrarum exactly resembling that seen in mother, but said to have developed recently. Also has left internal strabismus and some photophobia.

Mental Condition.—Is continually restless—utters peculiar and stereotyped cries. Interferes with and touches everything in neighbourhood. Cannot speak or do anything for himself. Resists examina-

tion. Is destructive, noisy, and boisterous, and interested in nothing. Mentally he is an infant.

CASE XV.—F. M. H., æt. 15. Athetoid movements of left hand in a feeble-minded epileptic. Fits began immediately after birth, and are of both major and minor type, occurring on an average once a fortnight.

Present Condition.—Marked scoliosis; right hip much higher than left. Right genu valgum. The left arm and hand are paretic. Vision of left eye is weak. Speech normal. Mentally she is facile and easily amused, and undoubtedly feeble-minded.

Family History.—Patient is one of four children. The paternal grandfather was an alcoholic. Mother had five miscarriages (?syphilis).

CASE XVI.—J. S., æt. 12. Motor tic in an epileptic imbecile (primary ament).

Family History.—Patient is one of ten children (8 living). The other two died in fits, one in infancy, the other at 9 years of age. Physiological development much delayed—walked at 5 years of age, did not talk until 8 years old. Fits began at age of 6 weeks, and have continued up to present time.

Present Condition.—Shows numerous scars due to falls during fits. Tongue is much furrowed. The right ear is malformed. Fits are of major and minor type. In addition he shows constant clonic and tonic movements of the head and eyelids, and at frequent intervals half closes his eyes. The clonic contractions rather resemble the intentional tremor of disseminated sclerosis, but are coarser in type and continuous. Mental status is low and bordering on idiocy. Some slight power of comprehension, but does not respond to questions. Cannot wash or dress himself, slavers, and is wet and dirty. He is obstinate and noisy, and exhibits echolalia to a pronounced degree.

From the study of the above cases certain facts emerge, which may be briefly summarised as follows:—The most predominant is the existence in the majority of the cases of a neuropathic basis for the affection, as evidenced by the co-existence of other neuroses or abnormalities of the nervous system, either in the individual case or in other members of the family. Seeing that the majority of the cases (13) were associated with amentia, or occurred in near relatives of aments, this is only to be expected. It is to be remarked, however, that of the 13 cases so described, 7 were examples of the acute (Sydenham's) chorea met with in ordinary practice. Three cases which lie outside this group (Cases I., II., and III.) were also of the acute type, and were equally associated with neuroses, either in the same individual or in near relatives.

Of the 16 cases dealt with, 8 were associated with epilepsy; in 3 the patient alone was affected; in 2 it occurred also in a relative; and in 3 near relatives were affected. Here, again, the class of material dealt with must be remembered, epilepsy being so frequently associated with amentia. Aldren Turner,¹ it may be remarked, states that epilepsy is found as an antecedent factor in chorea to the extent of 14·2 per cent.—the term being used here to denote chorea minor. He goes on to say: "It is obvious from a study of the literature of this subject that an intimate relation exists between epilepsy and chorea. The facts narrated show that chorea may predispose towards epilepsy and epilepsy towards chorea, the latter being the more common in my experience. In a neuropathic family epilepsy and chorea may be present in different members, *e.g.* one child may be an epileptic and another have chorea—an alcoholic father had two children, one an epileptic and the other choreic. Epilepsy and chorea may be present either simultaneously or at different times in the same person; in one such patient an attack of chorea was followed by freedom from fits for a year." The co-existence of epilepsy and chorea in different members of the same family is strikingly illustrated in Cases VII., IX., and X. Case III. is an example of chorea followed by epilepsy later in life. Finally, of the 8 cases associated with epilepsy, three were instances of motor tic.

As to the part played by rheumatism, it is noteworthy that in only 4 of the series was there an undoubted history of rheumatism. In one (Case II.) the chorea was associated with a definite attack of acute rheumatism and endocarditis; in another (Case VII.) it had been preceded by two attacks of acute rheumatism, and there was permanent involvement of the mitral valves; whilst in the third (Case VIII.) the patient was said to have had a "rheumatic heart" at the same time as the chorea. In Case VI. mother and grandmother had suffered from "rheumatism," and the latter had died of "dropsy." As, however, no details were available in several cases, it is possible that the part played by rheumatism was greater than these figures indicate. All four cases mentioned were of the acute (Sydenham) type.

There is a definite history of tuberculosis in six members of the series, all of them being cases of acute chorea. In two of them (Cases IV. and V.) the patients were cousins, and the occurrence of tuberculosis, chorea, and amentia in different members of the family is strikingly illustrated (*vide* diagram). Here, again, the definitely established relationship between tuberculosis and

the neuropathic diathesis is partly to be held accountable, in view of the material dealt with.

Out of the total of 16 cases, 9 occurred in conjunction with some degree of amentia, and these included three examples of acute type, two of chronic chorea, and four of motor tic. Further, of the 6 examples of the chronic type of motor affection, the majority (4) occurred in patients the subject of secondary amentia, 2 only being found in primary aments. The former showed either in the history or clinical picture evidence of gross cerebral disease occurring in infancy, and including respectively meningitis, hemiplegia, and spastic diplegia (birth palsy); one only (Case XI.), though undoubtedly traumatic in origin, not revealing any indubitable evidence of a localised lesion. In this connection Tredgold,² speaking of primary amentia, says: "Chorea is not common, but is found in some instances. Various forms of athetosis are fairly frequent in the severer grades. Intention tremor is occasionally seen. . . ." Later, in discussing the motor affections of secondary amentia,³ he says: "Jacksonian or epileptic convulsions occurred in a considerable proportion, whilst athetoid or choreiform movements are also frequently seen." Again, speaking of paralytic aments,⁴ he says: "In a few cases there is seen a constant rhythmic tremor or irregular choreiform movements without epilepsy," from which one gathers that chorea and allied conditions are, on the whole, more common in secondary than in primary amentia. Moreover, it is obvious that by chorea the chronic type of affection is meant.

Conclusions.—The limitations, both as to amount and type of material, here dealt with would preclude one coming to any dogmatic conclusions, but it may be helpful to see how far the findings agree with the accepted views as to the etiology of chorea. Reasons have already been adduced for grouping and considering these various affections under one head. It is of course usual to regard the acute chorea of children as a definite clinical entity in no way related to the chronic type of affection associated with organic disease of the cerebrum. Even when the term chorea is so delimited, there is no consensus of opinion as to its causation. Without going into any detail, it may be said that the general view is that it is merely one of the manifestations of acute rheumatism. Its frequent association with arthritic symptoms or with endocarditis, and its occurrence either in conjunction with rheumatism or as an alternative affection, have been urged in this connection. At the same time, many writers have

insisted upon its neuropathic relationships, notably Sturges (quoted by Osler⁵), who regarded it as "an expression of the functional instability of the nerve centres." The frequent occurrence of neuroses either in the individual or family history, its occasional supervention after severe fright or shock or school-strain, the related nervous and psychical symptoms, and its preponderance in females are among the reasons which have been adduced in favour of a neurotic origin. Galabin,⁶ *e.g.* in discussing the chorea of pregnancy, says: "It cannot be doubted that pregnancy promotes the disease in two ways: first, as a cause of reflex irritation, and, secondly, by impoverishment of the blood. The element of mental emotion, well known as a starting-point of chorea, is also added in some cases, as when an unmarried girl becomes pregnant. Those who suffer from chorea in pregnancy are generally young primipare, who have either suffered from the disease as children or have an hereditary tendency to neurosis." It is possible that by a too rigid adherence to the accepted classification the underlying neurotic basis has not been apportioned its due value. At all events, it may lead to a broader conception of the underlying cause if one regards chorea merely as a syndrome, varying in intensity and in duration and in clinical setting, and seek to determine the constant factor, if such there be, common to all the conditions under which it occurs. As Ivy Mackenzie⁷ rightly says, "if the phenomena are invariably the same, independent of the other pathological processes with which they are associated, there must be some common factor to account for the condition in all cases." He goes on to say,⁸ "the point of view which supplies a conception of this common factor is that which regards chorea as a functional disorder of an unstable brain, such instability being due in some cases to constitutional causes, in others to toxic exhaustion, and in still others to organic brain disease." It may be helpful to examine how far this view of the case accords with the result of the present analysis. One may assume that all the examples of acute chorea described in the present series fulfil the requirements of the above-stated view, inasmuch as they all afford evidence of a neuropathic constitution, accompanied in some cases by a rheumatic toxæmia. Although, for reasons above stated, the neuropathic background is more evident than it would be in an equal number of "average" cases, it must be borne in mind that the cases cited are of the classical type met with in ordinary practice, and it is possible that a systematic inquiry into the individual and family history of every case of chorea would

reveal a larger proportion of neuropaths than is generally conceded. In any case, the comparatively large number of cases of chorea and motor tic (13 out of the series of 80), either directly associated with amentia or occurring in near relatives of aments, is self-significant. With regard to chronic chorea and the motor tics the case is rather different. Of the 9 cases directly associated with amentia, it will be noted that in 3 it took the form of acute chorea, in 2 the chronic form, and in 4 that of motor tic—in other words, a chronic affection was the more common. Moreover, in the six examples of chronic type the majority (4) were found in association with secondary amentia, that is, with definite cerebral lesions. These were various in type, and comprised infantile meningitis (Case XIII.), hemiplegia (Case XV.), Little's disease (Case XII.), and one case (XL.) in which, although the movements were generalised, there was strong evidence of traumatic origin, resulting in an irritant lesion of the cortex. In other words, in most of these cases there is evidence of definite pathological change in the cells of the psychomotor cortex or their downward prolongations, and as the motor affection is found usually to be confined to the part of the body innervated by the damaged area, it seems reasonable to allocate to the latter an anatomical basis for the disorder, whatever type it may assume.

The two cases of motor tic in which there was no evidence of definite cerebral lesion, and which might appear to traverse this view of the case, were of such low mental status—one being an idiot and the other bordering on idiocy—as to suggest a very rudimentary development of the cortical neurones. Here one can hardly agree with Mackenzie,⁹ who regards all cases alike as "a functional disorder of the nervous system," which, in the type of case just described, "has been rendered unstable by the organic brain disease."

The evidence adduced would seem to assign to the neuropathic constitution a preponderating rôle in the etiology of chorea and allied disorders, but discloses strong reasons for differentiating, clinically and pathologically, between the acute type of short duration and the forms associated with states of cerebral subevolution and degeneration, whether these be of the primary neuronie type or sequential to vascular or inflammatory lesions.

REFERENCES.—¹ Aldren Turner, *Epilepsy*, p. 158. ² Tredgold, *Mental Deficiency*. ³ *Ibid.* ⁴ *Ibid.* ⁵ Osler, *The Principles and Practice of Medicine*, 4th ed. p. 1082. ⁶ Galabin, *A Manual of Midwifery*, 6th ed. p. 350. ⁷ Ivy Mackenzie, "Chorea," *Glasgow Med. Journ.*, June 1915. ⁸ *Ibid.* ⁹ *Ibid.*

A CASE OF CONGENITAL DESMOID TUMOUR OF THE
RECTUS SHEATH IN AN INFANT.

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IN advocating a new or in supporting the use of a seldom-used term, it is necessary to claim justification, and this is found in the fact that desmoid tumours, though fibromata, are so particularised etiologically, clinically, and pathologically, as to merit a distinctive name. Desmology is the accepted designation of the study of ligaments, and "desmoid" has its origin in common—*Δεσμος*, a bond; *Δεσμη*, a bundle. Not that the term is new, for it appears to have been first used by Johannes Müller in 1838, and in quite a recent work on tumours all connective-tissue tumours are spoken of as "desmomata."³ Desmoid at once suggests the tumour's origin from fasciæ and its characteristic hard ligamentous-like structure.

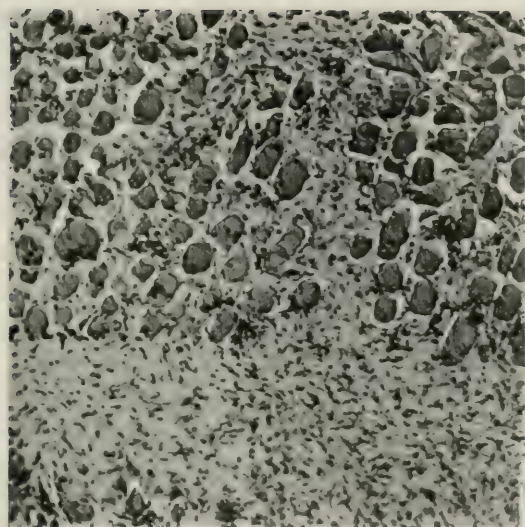
Desmoid tumours, then, are fibromata, that is, connective tissue gathered together in a fasciculus or bundle similar in consistence to ligamentous tissue, and thus are among the more uncommon tumours met with clinically. They arise in connection with the fascial tissues of the body to which they apparently owe their etiology. Their site of growth and their uniformity of consistence and structure justify the use of the term "desmoid" to accentuate their position and characteristics among the fibromata.

Perusal of older books on pathology or surgery containing references to tumours gives the impression that fibromata are common, but the care and accuracy of modern pathology have shown this to be a mistaken idea. Fibromata are really excessively rare. Indeed, in the latest edition of his delightful book on tumours, Bland-Sutton² ignores the possibility of the existence of such a tumour; a mere reference to fibrous tumours occurs briefly in the course of those chapters describing sarcomata, apart from sarcomata which have a fibrous appearance. The common belief that fibrous tumours were common must be ascribed to the universal knowledge of the existence of fibrous tissue and the mistaken impression which the old term, uterine "fibroids," was apt to convey.

It is certainly a departure from time-honoured custom (though none the less welcome for that) that such an authority as Bland-Sutton conspicuously omits fibromata from his list of connective-tissue tumours, but it will seem to some an unwarrantable omission, and certainly later books have not followed his example. There is perhaps a growing tendency to consider such fibrous growths as consequent on traumatism and the result of inflammatory reaction, and the consideration of the particular variety of fibromata under review is not free from the same suggestion.

In August 1910 I removed a desmoid tumour from the sheath of the rectus abdominis in a female child aged 1 year and 8 months. She was the younger of two children, her sister and parents being well. She had had no illness, but was said to have had a swelling in one groin, which was supposed to be a hernia noticed soon after birth, but which gave no evidence of its presence when she came under my observation. The tumour in the abdominal wall was noticed when she was about 8 months of age, and it had slightly increased in size since. There is, therefore, a strong suspicion that it was congenital. It was situated to the right and a little above the umbilicus and formed a round, flattened, densely hard tumour, almost an inch in diameter. The tumour had always remained hard, had never been reducible, and never varied during straining. The child had been wearing a pneumatic truss belt, as the parents had been told the swelling was a hernia. The tumour appeared to be within the sheath of the right rectus. The child was healthy though perhaps of a somewhat nervous temperament.

Under an anæsthetic the tumour was felt to be cartilaginous in hardness and could be lifted up as a flattened sphere, obviously in the abdominal wall. The skin was incised transversely and the anterior sheath of the rectus longitudinally. The muscular fibres appeared to be incorporated with the margins of the tumour and were dissected off with difficulty. The tumour was then found to be firmly fused with the anterior and posterior layers of the rectus sheath at one of the tendinous intersections, and some trouble was experienced in separating the anterior, while in removing the tumour from the posterior layer part of the sheath had to be sacrificed, together with the subjacent peritoneum, and the wound drawn together with catgut sutures. The child made an uninterrupted recovery, but unfortunately I have been unable to trace its whereabouts and obtain information of its subsequent history.



Section of Desmoid Tumour ($\times 200$) of Rectus Abdominis Muscle, showing Intimate Relation at Margin between Tumour Tissue and Muscular Fibres.

The tumour was examined by Professor Sutherland, who reported: "The growth is macroscopically a hard fibroma, but on microscopic examination is more cellular than a hard fibroma. Remains of muscle tissue are found amongst the fibres." This is well shown in the accompanying photomicrograph. To my inquiries he further reported: "The suspicion of sarcoma arose but was dismissed." In this relation I may quote Bland-Sutton: "The difficulty of distinguishing between myoma, a slowly growing spindle-celled sarcoma, and a fibroma is well known to skilled pathologists."

The first attempt at an exhaustive consideration of desmoids was that of Lederhose⁵ in 1890, and his lead was followed by Pfeiffer in 1904, while four years later Harvey Stone¹ reviewed the subject and added one case of his own. In these papers, and indeed in all the literature of the subject, one is confronted with the difficulty of separating what might be true desmoids from fibro-sarcomata and typical sarcomata. Indeed, the difficulty of obtaining a record of pure fibromata supported by pathological investigation is almost in itself justification of Bland-Sutton's scepticism of its existence. But another point evolves, namely, the great rarity with which desmoids have been observed in infants. Lederhose does not note the occurrence at all, while Pfeiffer writes, "a rare case or two considered congenital is on record." In Morrison and Drummond's⁴ paper on "Desmoid Tumours" seven cases are recorded, yet each was reported on as a sarcoma. Congenital sarcomata are recognised, but are pathological entities not to be confused with desmoids. Few, indeed, commit themselves as in Cullen's⁸ case, that of a married woman, aged 30, who had a tumour on the left side of three years' duration, springing from the sheath of the external oblique. Histological examination proved it to be a typical fibroma, and the pathologist "failed to find any areas suggestive of malignancy."

Desmoid tumours originate in the abdominal wall in the fascial aponeurosis, in the deep fascia itself, the tendinous intersections of muscles, Poupart's ligament, the linea alba, or the fascia transversalis, and it is questionable if in the female the hard tumours sometimes found in connection with the round ligament do not contain muscular fibres and become fibromyomata. Lederhose gives a list of the "fibromata of the abdominal muscles and aponeuroses whose seat and evident point of attachment were settled—36.

"1. <i>A. Rectus and its sheath</i>	16
(Of these, the posterior sheath 6)	
<i>B. External oblique abdominal muscles and other</i>	
aponeuroses	11
<i>C. Fascia transversalis</i>	5
<i>D. Linea alba</i>	4
2. Fibromata of abdominal muscles and aponeuroses,	
the seat and origin not settled	36
3. Fibro - sarcomata of abdominal muscles and	
aponeuroses	28."

The preponderance in women is very great. Out of 100 cases quoted by Lederhose only 10 occurred in men. The tumours are solitary, and there is no record of multiplicity. They are densely hard and well defined, and if in the rectus sheath are generally ovoid, the long axis corresponding to the direction of the muscle. The tumours are said, on occasion, to undergo cystic or myxomatous degeneration.

The rarity in children has already been referred to. The immense majority are in adults in the third and fourth decade of life. Lederhose states that 90 per cent. of fibrous tumours growing in the abdominal wall occurred in women, and of the ninety 70 per cent. had borne children. Pfeiffer found 87 per cent. in women, and of these 94 per cent. had borne children. Stone maintains that the most frequent site of desmoid tumours is in the lower quadrant of the abdomen, but agrees that it is most frequent in the rectus, next in the fascia of the external oblique, then the fascia transversalis, and then the linea alba. History of sprain, a strain during parturition, or direct trauma is too frequent and definite to be ignored. On the other hand, other muscles and tendons are contused and ruptured, but no fibroma develops in that, and in desmoids examination never shows any evidence of previous hæmatoma. It is, indeed, not improbable that the muscle ruptures because of the presence of a desmoid, rather than that the desmoid follows the injury. Like osteomata in the adductor muscles of the thighs which are discovered accidentally in few who are compelled to ride, in countries where conscription obtains, desmoids appear to be found in the abdominal muscles of adults where the muscles are called into full physiological activity. This might account for the frequency with which they are found in women during the period of sexual activity, and the increase of growth after pregnancy might be due to the alteration taking place in the abdominal walls and the increase of the blood-supply accompanying these alterations.

In my case I have no doubt the tumour was a congenital one, for it was of considerable size when it was noticed at the age of 8 months, and it had grown slowly, if at all, after that. It appeared to me to be originating from the tendinous intersection of the muscle and more towards the posterior surface of the muscle than the anterior surface, thus accounting for the particular involvement of the posterior layer of the sheath. The microscopic demonstration of the relation of the muscular fibres to the edge of the tumour makes it appear as if the tumour were analogous rather to the fibrous tissue of the intersection than to that of the sheath.

As regards treatment, all writers advise early removal, and this is all the more necessary as it must be clinically uncertain whether a sarcomatous element be present or not, an uncertainty which even pathologists are apparently not always able to remove.

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³ White, C. P., *The Pathology of Growth Tumours*, London, 1913. ⁴ Morrison, R., and Drummond, H., "Desmoid Tumours," *Lancet*, 5th November 1910.
⁵ Lederhose, I., "Die Chirurgischen Erkrankungen der Bauchdecken und die Chirurgischen Krankheiten der Milz," *Deutsche Chirurgie*, Stuttgart, 1890, Bd. xlv.
⁶ Eccles, W. M., "Three Cases of Fibro-Sarcoma of the Muscles of the Abdominal Wall," *West London Med. Journ.*, London, 1906, vol. xi. p. 222.
⁷ Bidwell, L. A., "Two Cases of Fibro-Sarcoma of the Abdominal Wall," *West London Med. Journ.*, London, 1906, vol. xi. p. 224. ⁸ Cullen, "Fibroma of the Abdominal Wall, Springing from the Sheath of the External Oblique," *The Johns Hopkins Hospital Bulletin*, Baltimore, 1905, vol. xvi. p. 397.

CLINICAL RECORDS.

CASES FROM THE EAR AND THROAT DEPARTMENT
OF THE ROYAL INFIRMARY, EDINBURGH.

UNDER THE CHARGE OF

A. LOGAN TURNER, M.D., F.R.C.S.E., F.R.S.E.,

AND

THE PATHOLOGY DEPARTMENT, ROYAL INFIRMARY,
EDINBURGH.

UNDER THE CHARGE OF

PROFESSOR LORRAIN SMITH.

TWO CASES WITH MULTIPLE INTRACRANIAL COM-
PLICATIONS OF CHRONIC SUPPURATIVE OTITIS
MEDIA: RECOVERY AFTER OPERATION.

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CASE I. — *Chronic Suppurative Otitis Media (Right) with Cholesteatoma — Radical Mastoid Operation ; later, Labyrinth Suppuration—Second Operation ; Septic Thrombosis of Sigmoid Sinus and Internal Jugular Vein—Third Operation ; Suppuration in and around Jugular Bulb—Fourth Operation ; Recovery.*
—R. T., female, aged 20, seen for the first time on the 16th of October 1914. Patient has had discharge from her right ear for many years. Conservative treatment has been carried out—peroxide of hydrogen drops and lysol syringing—but in spite of this she suffers considerable pain in the ear.

On Examination.—The right ear shows pus and granulations in the meatus, and there is slight mastoid tenderness. The patient's name was entered for operation, but she was not admitted until the 17th of February 1915.

On Admission.—Temperature, 98.4° ; pulse, 76 ; respirations, 20.

Patient then stated that she had been giddy occasionally for the past two or three months. On examination there was a red fleshy polypus present in the right external meatus. Above this pus was present with cholesteatoma. With the left ear closed by the finger the conversation voice was heard at two feet, while, with the noise apparatus in the left ear, the raised voice was heard at a few inches. Tuning-fork tests showed middle ear deafness on the right side ; thus Schabach's test was lengthened, Weber's test lateralised to the bad ear, while Rinne's test was negative on the right side. The low tuning-forks, C₅₂ and C₆₄, were heard by the left ear but not by the right. The vestibular tests were as follows:—Slight spontaneous nystagmus both to right and to left, but most marked to the right (diseased side). There was no Rhombergism, and the spontaneous pointing test was normal. *The fistula symptom was absent.* The rotation test was, unfortunately, not applied, but cold syringing of the right ear

produced rotatory nystagmus to the left in 45 seconds, with the typical falling and pointing error afterwards. From this examination it would appear that the labyrinth was normal, but operation showed that this was not quite the case.

18th February 1915.—Radical mastoid operation on the right ear (J. S. F.). When the mastoid was exposed it was found that there was an erosion of the cortex, due to the large mass of cholesteatoma. The erosion was about the size of a split pea. On removing the whole of the external aural wall a very large smooth-walled cavity was found. The cholesteatoma membrane lining this cavity was removed. The outer part of the posterior meatal wall was removed with the chisel—the inner part having already disappeared through the pressure of the cholesteatoma. The malleus and incus were absent, but the attic cavity was full of cholesteatoma. After removal of this membrane it was found that the aural polypus was coming from the usual situation, *i.e.* the posterior part of the promontory. The facial canal appeared normal, but the external semicircular canal was markedly eroded. It was *not* investigated with the probe.

Cold lotion was now applied to the inner wall of the operation cavity. Had the labyrinth been normal, this would have resulted in conjugate deviation of the eyes to the lower (left) or healthy side, but, as a matter of fact, there was no response, and the eyes remained looking straight forward.

It will be remembered that there was a ready response from the superior canal when the case was tested before operation. It would appear, therefore, that the case was one of circumscribed labyrinthitis in the external canal which was so advanced that the fistula symptom was not present. As labyrinthine symptoms were absent before operation, and as a certain amount of hearing power was present, it was decided not to perform the labyrinth operation.

Koerner's meatal flap was cut, the cavity was swabbed out with peroxide of hydrogen and then with lukewarm saline lotion, and a skin graft cut from the retro-auricular flap was applied to the facial spur. The operation cavity was then packed with iodoform worsted, and the posterior wound closed with silkworm stitches.

19th February.—Temperature, 101° F.; pulse, 104; respirations, 24. As the operator was absent in London he was unable to note the condition of the patient, but later he was informed that there was not more sickness than usual after the operation. The patient was at once put upon urotropin.

20th February.—Temperature, 98·4° F.; pulse, 96; respirations, 24.

21st February.—Temperature and pulse as yesterday. Nystagmus as before operation. Patient complains of slight giddiness. She is not deaf in the operated ear, even when the noise apparatus is sounding in the good ear.

25th February.—Temperature has been about 98° since last report and pulse 84. Nystagmus as already reported. No headache or vomiting. Tongue is clean. Wound dressed to-day and found to be septic. Strangely enough the skin graft is still in position on the facial spur. Patient can hear the conversation voice at two feet with the left ear closed with the finger.

1st March.—Case is very septic, and for the last two days the temperature has risen to between 101° and 102° F. and the pulse to 104. There is no vomiting, but patient complained of headache last night and did not sleep well on account of pain in her ear. The right ear is not quite deaf, even with the noise apparatus sounding in the left ear, and there is still slight nystagmus to both sides. The tongue is furred but moist, and there is no stiffness of the neck.

3rd March.—Yesterday the temperature rose to 104, the pulse to 120, and

the patient complained of severe headache. On the other hand the tongue is clean and moist, and there are no rigors or even cold feelings. The patient complains of frontal headache. Nystagmus and hearing tests as before. The patient looks flushed and heavy, but there is no stiffness of the neck, no Kernig's sign, and no retraction of the head.

In spite of being dressed twice daily the ear is still very septic. The patient vomited last night when the ear was washed out. The case does not look like one of abscess of the brain as the patient is mentally bright.

6th March.—Vomiting and frontal headache still present. Tenderness on tapping over right cerebellar fossa. The patient is now quite deaf in the right ear, and there is no response to the caloric test. The nystagmus to left is more marked, but is only of the first degree. During the 4th and 5th the temperature varied between 98° and 99° F., but to-day the temperature has gone up again to 103° F., and there is distinct tenderness over the cervical spine and some stiffness of the neck. There is a pointing error to the right with both hands. The tongue is still clean and moist.

From the above examination it was evident that the right labyrinth was now destroyed, and it was possible that meningitis was beginning. 5 P.M.—*Second Operation.*—Lumbar puncture performed and cerebro-spinal fluid found to be clear and not under tension.

The wound was opened up and the sinus, which was already exposed, was carefully inspected. The dura was then separated from the posterior surface of the petrous bone internal to the sinus, and was guarded with the Stacke protector, while the bone was removed in an inward and forward direction until the posterior and external canals had been freely opened up. It was now seen that the external canal had been markedly eroded at the time of the first operation. The smooth end of the external canal was followed up into the vestibule (Neumann's operation). Finally, the promontory was chipped off. No escape of pus was noted from the vestibule.

7th March.—Temperature still up between 102° and 104° F.; pulse, 100 to 114; respirations, 24 to 28. There was no vomiting or headache. Nystagmus to the left as yesterday.

8th March.—Patient has had a good night. There is no vomiting, but headache is again present to-day. Temperature still 102° F.—last night it was 104° F.; pulse, 114; respirations, 26. The nystagmus to the left is more marked, and there is still a pointing error to the right with both hands. Patient does not look very ill, and the tongue is clean and moist.

10th March.—Patient still complains of occipital headache. Temperature, 103 to 104° F. at night, but down in the morning to 97° F. Blood-cultures give a growth of streptococcus—some of the chains contain as many as eight elements. A mouse was inoculated with a comparatively large dose of the streptococcus but did not die. The organism was therefore not the pneumococcus.

11th March.—Temperature up again last night, and a somewhat indefinite history of shivering was obtained. Patient complained of tenderness behind the right shoulder. 11.30 A.M.—*Third Operation.*—Transverse incision was made backwards from the upper knee of the sinus, and the bone was removed for two inches before the healthy, shining, bluish wall was reached. The sinus was then slit up and found to contain clot in its anterior portion. Some pus also escaped. The torcular end of the sinus was then plugged by packing with iodoform worsted. The anterior wall of the sigmoid sinus was excised. In

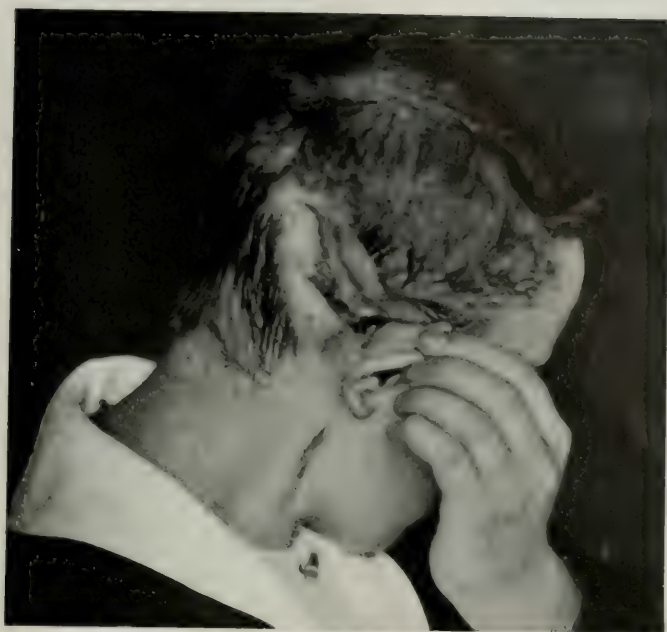


FIG. 1 (Case I).—Note Granulating Wound after Operation on Lateral and Sigmoid Sinus; also Scar after Jugular Ligation.



FIG. 2 (Case II).—Note Hernia Cerebelli and also Scar following Operation on Jugular Vein.

spite of free removal of bone, no bleeding could be obtained from the bulb end of the sigmoid sinus. The internal jugular vein was therefore ligatured in the neck, and was found to contain clot down to the junction with the common facial. Below this point the vein was healthy. The common facial vein was tied off. The upper end of the jugular vein was opened and bled very freely, thus showing that the inferior petrosal sinus was healthy. The neck wound was left open, and no attempt was made to wash through the jugular bulb from above.

(The blood-clot from the sigmoid sinus yielded a mixed growth of pneumococci, streptococci, staphylococcus albus, and of bacilli which strongly resembled diphtheria bacilli. A coliform bacillus was also present which, from its reactions to the sugar tests, resembled the dysenteric group, but from its growth on agar and its smell was obviously not a true dysenteric bacillus.)

12th March.—As usual, after the sinus operation and jugular ligature, the temperature is subnormal to-day—97° to 98° F.—pulse, 94. No vomiting.

13th March.—Temperature has risen to 100° F. Case dressed. Attempt to wash through the bulb proved a failure. Free bleeding from the upper end of the jugular vein in the neck.

14th March.—Patient has had a good night, but complains of occipital headache to-day. Temperature, 100° F.; pulse, 94; respirations, 24.

17th March.—Evening temperature has been rising for last two days to 102° F. This morning the patient vomited after the administration of Epsom salts. The wound is granulating well, though there is some pus from both ends of the sigmoid sinus. There is no headache or vomiting, and the tongue, as always, is clean and moist. The patient herself looks well.

23rd March.—Temperature varies from normal in the morning to 102° F. at night. The patient herself is much paler and thinner than formerly. Pus is coming from the jugular bulb end of the sigmoid sinus, which is being drained with a strip of gauze. The torcular end of the sinus, however, is doing well, and the neck wound is also satisfactory. The question of operation on the jugular bulb is being considered.

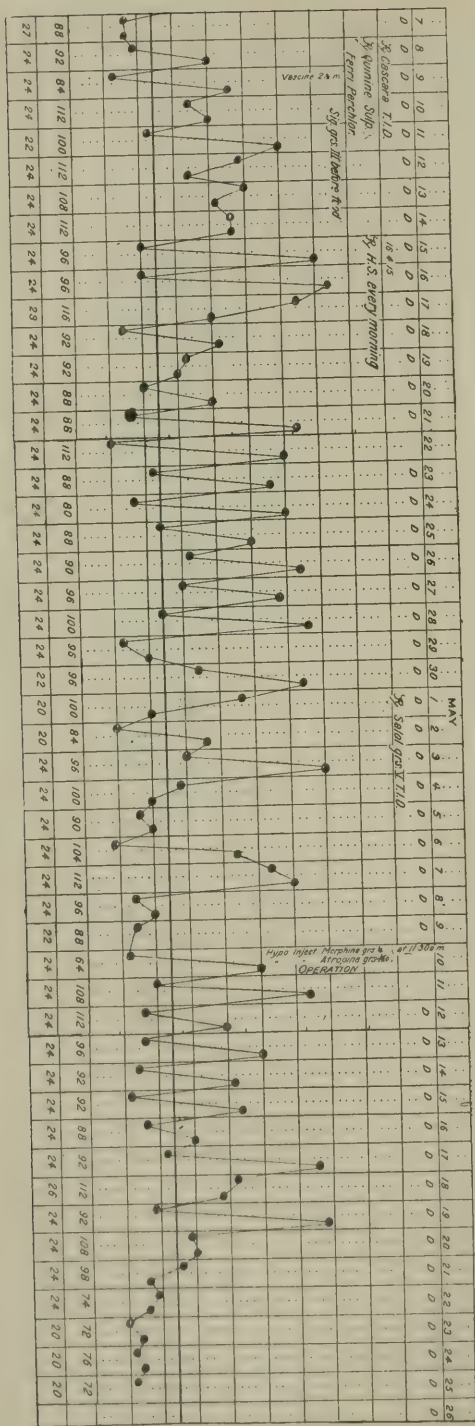
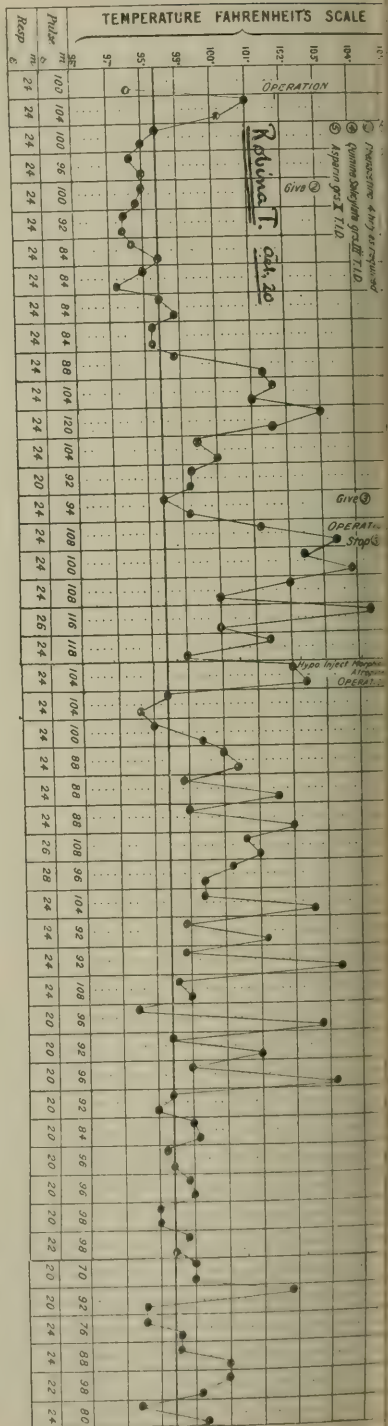
3rd April.—On the 26th of March the temperature came down to normal, and for the next seven days did not go above 99° F. Yesterday, however, the temperature went up to 102° F. The neck wound is healing. There is a little pus now in the torcular end of the sinus. There is no nystagmus now, and the ocular fundus is normal in both sides.

9th April.—Case is doing fairly well. Temperature occasionally rises to 100° F. at night. The torcular end of the sinus appears to have healed and the neck wound has almost healed. A mixed vaccine is being administered.

24th April.—Patient complains of tenderness in suboccipital region on right side. For the last four days evening temperature has reached 102° F., and there is still discharge of pus from the bulb end of the sigmoid sinus. There is marked tenderness in the cervical region on pressure over the spines of the vertebrae and also over the right sterno-mastoid, and there appears to be some swelling in the right suboccipital region. There is no vomiting or rigor.

3rd May.—Temperature oscillating as before. About a teaspoonful of pus was to-day evacuated on opening up the torcular end of the sinus. A dose of antistreptococcal serum was given this evening. Occasionally during the dressings the patient complains of pain in the eye. For some time now the wound has been dressed with hypertonic saline solution.

9th May.—For the last two or three days there has been a considerable



quantity of pus welling up through the floor of the right external auditory meatus. On probing, bare bone is felt in this region.

10th May.—In view of continuance of hectic temperature and of abscess-formation below the floor of bony external auditory meatus, it was decided to investigate the region of the jugular bulb. *Fourth Operation.*—The floor of the bony meatus was almost entirely removed, together with the remains of the mastoid process; although the face twitched once or twice, there was no subsequent paralysis. The ascending portion of the sigmoid sinus was traced up to the jugular bulb, and a considerable quantity of pus was evacuated not only from the cavity of the bulb but also from the tissues at the base of the skull outside the bulb. The posterior portion of the mastoid and the adjoining portion of the occipital bone were investigated, but no signs of osteomyelitis were found.

20th May.—From the 10th to the 19th there was a continuance of the hectic temperature, though the evening rise was hardly so great as before. There is now a free discharge of pus from the large wound in the neck below the right ear and a continuance of the tenderness in the suboccipital region.

30th May.—There has been no fever for the last ten days. The temperature has been between 97° and 98° F., and the pulse has varied from 72 to 80. The wounds are granulating well, and the tenderness over the neck is much less marked.

20th June.—Patient is doing well and gaining weight rapidly. Temperature normal; wounds healing quickly.

Remarks.—The case was one of chronic middle ear suppuration with extensive cholesteatoma formation, which had so greatly enlarged the mastoid antrum that the cortex was eroded and the cholesteatoma matrix exposed when the mastoid periosteum was retracted at operation. Functional examination before operation had shown that the labyrinth was healthy and that compression nystagmus (fistula symptom) was absent. The caloric reaction to cold syringing was present, with the head in the upright position, thus showing that the superior canal was functioning. At the first operation an erosion of the right external canal was noted, and it was found that on applying cold lotion to the inner wall of the middle ear there was, with the patient's head in the lying position and the right ear uppermost, no conjugate deviation of the eyes to the opposite side. This showed that the right external canal was not functioning, *i.e.* that the circumscribed labyrinthitis following the fistula had blocked the endolymphatic space in the external canal, but had not so far affected the superior canal. At the first dressing (five days after operation) it was found that the wound was suppurating, but the right ear still retained the hearing function. About ten days after operation the evening temperature reached 102° or 103° F.: the patient appeared flushed, and headache and vomiting developed. The tongue, however, remained moist and clean—a condition never before met with by the writer (J. S. F.) in a case of otitic venous infection, and one which led to regrettable delay in operating on the sigmoid sinus. There were no rigors. One week later (6th March) it was

evident that the right labyrinth was destroyed (complete loss of hearing and of caloric reaction, and deviation in the pointing test). Such symptomless destruction of the labyrinth has been recorded by Ruttin. In order to drain the infected labyrinth and obviate, if possible, the onset of leptomeningitis, the second operation (Neumann's labyrinth operation) was performed. In spite of this the temperature continued to rise in the evening (104° F.), and a blood-culture showed a pure growth of a streptococcus. It was now evident that in spite of the normal condition of the tongue a blood infection was present; and accordingly, on the 11th March, a third operation was performed, and the right sigmoid and anterior portion of the right lateral sinus were found to be thrombosed. As there was no bleeding from the bulb end of the sigmoid sinus the right internal jugular vein was ligatured. In spite of the above operation, it was soon evident that we had not got to the end of the trouble. Evening fever continued, along with tenderness in the right suboccipital region. In spite of the administration of an autogenous vaccine and later antistreptococcus serum, and the local use of hypertonic saline lotion, the signs and symptoms of infection of the jugular bulb continued. On the 9th May pus was found welling up into the wound cavity from beneath the inner end of the floor of the external meatus. A fourth operation was now performed—the posterior operation on the jugular bulb (10th May)—and pus was evacuated from the bulb itself and from the peribulbar tissues. Even then the signs of venous infection did not pass off immediately—probably the condylar veins were also involved; but by the end of the month the fever had disappeared, and thereafter the patient made a good recovery.

CASE II.—Chronic Suppurative Otitis Media; Extradural Perisinus Abscess; Purulent Leptomeningitis—First Operation; Septic Thrombosis of Sigmoid Sinus, Jugular Bulb and Upper Part of Internal Jugular Vein; Second Operation; Pyæmic Abscess and Gangrene of Lung; Cerebellar Abscess—Third Operation; Recovery.—M. S., aged 13 years, was admitted on the 14th January 1915. Patient had foul-smelling discharge from the right ear since an attack of measles some years ago. On the 8th of January 1915 she complained of great pain in the right ear, followed by vomiting and retraction of the head. There was no history of rigors.

On examination there was great tenderness over the right mastoid antrum, and otoscopy revealed sagging of the posterior superior wall of the external meatus. This prevented further inspection of the right ear. The patient was too ill for a detailed functional examination, but the right (affected) ear was not quite deaf even when the noise apparatus was applied to the left ear. The girl could also hear the medium tuning-forks by air conduction by the right ear, and in Weber's test the tuning-fork on the vertex was lateralised to the right (affected ear). Rinne's test was negative on the right side. There was no spontaneous nystagmus, but the child was too ill for rotation and for caloric tests. Temperature, on admission, 100.6° F.; pulse, 100; respirations, 22.

The patient appeared to be in great pain, and cried out frequently (meningitic cry). There was marked retraction of the head, and the knees and thighs

were kept flexed (Kernig +). The tongue was dry and covered with yellowish-brown fur.

The child was at once admitted to the ward, and lumbar puncture performed. The cerebro-spinal fluid was under great tension and very turbid—almost purulent. The fluid was acid in reaction, and contained a great excess of albumin. Films showed very large numbers of pus cells with a few red blood corpuscles and many Gram-positive cocci, in pairs and short chains, which on further examination proved to be short-chained streptococci.

5.30 p.m. on day of admission.—Radical mastoid operation performed on right ear (J. S. F.). The mastoid cortex appeared rather pale, as if the bone were devitalised. The first gouge cut opened a large extradural abscess around the sigmoid sinus, which was further forward than usual. The abscess contained foul-smelling, brownish-green pus. The mastoid antrum was small, but contained cholesteatoma. The posterior wall of bony meatus was removed, and the radical mastoid operation completed. The malleus and incus were removed, the latter ossicle being eroded. The tympanic cavity was full of granulations.

As the wall of the sigmoid sinus looked brownish and sloughy, a second incision was made in a horizontal direction backwards from the middle of the original cut, and the anterior portion of the lateral sinus exposed until healthy wall was reached. The sinus was opened at this part, and a copious gush of blood escaped. Iodoform worsted was therefore packed into the sinus and the operation cavity was lightly plugged. The wound was not stitched. Films made from the pus obtained from the perisinus abscess showed no organisms; cultures on blood-agar proved sterile after 48 hours.

15th January.—Patient had a good night after an injection of morphia. Temperature, 96.6° F.; pulse, 80; respirations, 24, at 8 a.m. to-day.

Kernig's sign still present on the right side. No knee-jerk obtained on the right side. Babinski's sign present on right side. On the left side Kernig's and Babinski's signs absent.

By 12 noon the child was again crying out, and a second lumbar puncture was performed. The fluid was again cloudy to purulent, but was under much less tension. Temperature, 100° F., at 8 p.m.

16th January.—Temperature, 100° F.; pulse, 112; respirations, 24. Child looks ill, and there is marked herpes on the upper lip. The patient does not answer questions, but puts out tongue if asked to do so. Kernig's sign present on both sides; abdomen rather retracted; no nystagmus. Patient is getting atropine, 5 grs., thrice daily.

17th January.—Temperature, 100° to 101° F.; pulse, 96; respirations, 24. Wound dressed and appeared very inactive. Third lumbar puncture performed under ethyl chloride anaesthesia. (Pathological Report.—No organisms were found in films, and no growth on blood-agar in 24 hours.)

18th January.—Patient somewhat better; no headache. Temperature, 98.2° F.; pulse, 92; respirations, 24. Spontaneous nystagmus to left (sound side). No nystagmus on looking straight forward or to right.

19th January.—Patient better; has had good night. Lumbar puncture yielded clear fluid, which came out in drops. (Pathological Report.—No increase in cells in centrifuged deposit, and no organisms were found in films. There was no growth on a blood-agar slope, but a pure growth of streptococci was obtained on a very richly inoculated blood-agar plate.)

To-day for the first time there is nystagmus of the second degree to the right side (diseased ear). Wound dressed and all packing removed. No

hæmorrhage from the sinus. The discharge from the ear wound is very foul-smelling.

20th January.—Temperature rose to 104° F. yesterday afternoon, and pulse to 120. This morning pulse is 110; temperature, 99·6° F.; respirations, 24. The symptoms of meningitis are passing off. There is no restlessness or irritability, and the patient does not complain of headache. There is no paralysis of the eye muscles, no double vision, no photophobia, no pain on pressure on eyeballs. Pupils moderately dilated and equal—react to light and accommodation. The abdomen is not retracted. Kernig and Babinski signs are absent. The knee-jerks are present and equal. Abdominal reflex present.

On the other hand, patient is lying curled up on her left side. The tongue is furred and the breath is foul. Constipation is present. The mental condition is fairly good, and the girl answers questions at once. There is some stiffness of the neck, and when she sits up the patient holds her head with her hands. When requested, the head is moved stiffly from side to side or up and down. There is tenderness over the right occipital region and over the sternomastoid on the right side. There is no vomiting. Although the patient is right-handed, the grasp of the right hand is not so strong as that of the left, and on trying the pronation and supination tests the right hand tires more easily than the left (*dysidiadokokinesia*). The spontaneous pointing test is normal. There is slight spontaneous nystagmus to the right (diseased side) to-day, but this is only of the first degree; yesterday it was of the second degree. With the left ear closed with the finger the patient can hear the conversation voice at six inches, through the bandages covering the right ear. With the noise apparatus going in the left ear the patient repeats the raised voice close to the right ear. Labyrinthitis is therefore excluded.

There is no pain or swelling in any of the joints, no hæmorrhages in the skin, and the spleen is not enlarged.

Wound dressed—not much reaction; a little pus present between the bone and dura internal to the sinus.

Ten minutes after the above dressing a rigor occurred, the temperature rising to 103·6° F. In view of this, and of the rise of temperature yesterday and of the condition of the sinus wall at operation, it was decided to open the sigmoid sinus below the point at which bleeding was obtained at the first operation.

20th January.—*Second Operation*, 5 P.M.—More bone removed from tip of mastoid process in the direction of the jugular bulb. Sigmoid sinus slit up and found to be thrombosed. Free bleeding again obtained from lateral sinus, behind entrance of superior petrosal. This portion of sinus again packed with iodoform worsted. On following up the sigmoid sinus towards the jugular bulb, free bleeding was not obtained. Accordingly an incision was made in the upper part of the neck along the anterior border of the sternal mastoid. A large jugulo-digastric gland was found and excised. This gave access to the junction of the internal jugular and common facial veins. The latter, along with the lower part of the internal jugular, appeared to contain fluid blood, but the upper part of the internal jugular appeared solid, and proved to be so. The common facial was divided between ligatures, and the internal jugular was also ligated in two places and divided. The upper end of the vein was slit up. (Pathological Report.—Cultures from the wall of the lateral sinus gave pure colonies of streptococcus, as did also the clot from the jugular vein. The jugulo-digastric gland was also examined, but no streptococci or other organisms were found in the acutely inflamed gland.)

21st January.—Temperature, 98° F.; pulse, 92. Patient had a good night.

22nd January.—Patient has vomited twice during the night. Temperature still elevated—99·8° F.

There is nystagmus to the left (sound side). On looking to the right there are large slow nystagmic movements—evidently the nystagmus is of the “extraordinary” type. On testing the pointing reaction at the wrist joint the right hand deviates to the right. Dr. Sym reports “no œdema of the optic discs, but dilatation of the veins.”

The question is, Are these new symptoms (“extraordinary” nystagmus, pointing error, and vomiting) due to a continuance of meningitis on the posterior fossa, or are they due to cerebellar abscess?

23rd January.—Temperature, 102° F. last night; pulse, 112. Kernig’s sign present. Interference with movements of head. Vomiting present. Tongue furred. Nystagmus as yesterday. Wound dressed; bone looks whitish-green, and discharge has a very foul odour. The upper end of the neck wound also appears rather sloughy.

24th January.—Child is now spitting up foul-smelling, brownish-red material. Temperature again elevated; vomiting continues. Wound dressed, plug removed from lateral sinus, only slight bleeding; discharge had a foul odour.

25th January.—Temperature, 102° F.; pulse, 116; respirations, 32. Child again complains of headache and stiffness of neck, and to-day of pain in the right side of the chest. The girl appears very ill and there is a marked septic smell, but this is probably due to the lung condition. There is marked pigmentation of the skin of the abdomen and slight desquamation (the grandmother of the child is said to have died of Addison’s disease). Patient can still hear with the right ear, and on syringing the inner wall of the operation cavity with cold lotion there is a marked increase in the spontaneous nystagmus to the left, thus showing that both functions of the right labyrinth are retained.

In view of the presence of vomiting, headache, retraction of head, extraordinary nystagmus, pointing error, and as child was obviously going downhill, it was determined to open the dura of the posterior fossa through the large area exposed in the operation on the sinus.

1 P.M.—*Third Operation.*—Crucial incision in dura. The right lateral lobe of the cerebellum was adherent to the dura, and did not bulge out when the incision was made. Right lateral lobe of cerebellum incised and a gush of yellowish-green foul-smelling pus is obtained. (Pathological Report.—A diplo-streptococcus was obtained and bacilli of the colon and proteus groups.)

The pus was allowed to drain away slowly, and the abscess cavity lightly packed with strips of sterile gauze. Lumbar puncture yielded clear fluid under tension.

26th January.—Patient rather better. No vomiting, headache, or retraction of head. Patient lying on right side. Nystagmus to right now absent, but fine nystagmus to left still present. Temperature, 101° to 102° F.; pulse, 118; respirations, 32. The patient has a hacking cough. (Pathological Report. The sputum contains pneumococci, streptococci, Gram-positive bacilli, diphtheroids, Gram-negative bacilli, Gram-negative diplococci, etc. No tubercle bacilli were found.)

The wound was dressed and abscess found to be draining well; lateral sinus also doing well.

27th January.—Temperature, 101·4° F.; pulse, 112; respirations, 36. The wound surfaces show a few pale flabby granulations. Abscess draining well. Neck wound also granulated.

28th January.—Temperature, 102° F.; pulse, 100; respirations, 28. Child takes food well; no vomiting or headache.

29th January.—Child suffers much from cough and expectoration. Dr. Edwin Bramwell examined the patient and found signs of a cavity in the right lung.

30th January.—Considerable flow of pus to-day from region of jugular bulb. Temperature, 102° F.; pulse, 108; respirations, 28. The cerebellum now pulsates well. No nystagmus to the diseased side, but slight nystagmus to the sound side. Abscess cavity in cerebellum quite dry; torcular end of sinus also dry. Herpes has disappeared. Tongue is clean.

4th February.—Temperature has varied from 100° to 102° F.; pulse, 108 to 120; respirations, 26 to 30. The patient is much emaciated. Abscess cavity draining well. Pointing test normal. Patient is now spitting up yellow purulent material which still has a foul odour. Antiseptic inhalations are being used with a Burney Yeo respirator, and an "ozone-air" apparatus is also being employed. The girl takes her food well, and the wound is granulating freely.

6th February.—The last two days there has been some recurrence of headache and some hernia cerebelli. Lumbar puncture again performed and fluid found to be turbid, and under greatly increased pressure. The fluid contained large numbers of cells, chiefly polymorphs. No streptococci were seen, but a few coliform Gram-negative bacilli were present. On culture there was a pure strong growth of a bacillus, which probably belongs to the colon group.

There is still a considerable amount of pus from the bulb end of the sigmoid sinus. Attempts to wash through from the bulb end of the sigmoid sinus to the neck wound have always failed hitherto and failed again to-day.

8th February.—The temperature now swings from a hundred or less in the morning to 102° F. or over at night. To-day patient again complains of headache. Urotropin again being given. The neck wound has now almost healed, but there is still considerable quantity of pus from the region of the bulb. The cerebellar abscess cavity is quite free from pus, and the mastoid cavity is now covered with granulations. The wounds are being dressed with a hypertonic saline solution, and this certainly seems to have increased the discharge. Patient is sleeping and taking food well, but is still spitting up a large quantity of foul yellow pus.

14th February.—Temperature and pulse more satisfactory. Lumbar puncture performed; pressure slightly increased and fluid rather turbid. There were many pus cells and lymphocytes in the deposit, but no growth was obtained.

24th February.—Patient much better. Temperature varies from normal to 100°. Child vomited yesterday after tea. Kernig's sign present on right side.

1st March.—Patient not so well, very feeble and thin. Pulse thready, head retracted, cerebellum bulging. Packing of cerebellar abscess discontinued for last two days, but to-day abscess opened up and a considerable quantity of pus evacuated. Temperature, 98° F.; pulse, 116. Patient has been semi-comatose for two days. Tongue rather dry and furred. Still marked pigmentation of skin of abdomen. Expectoration continues. Lumbar puncture performed; fluid turbid and under increased tension. Films of the deposit show numerous polymorphs, with a few lymphocytes and some large cells. No organisms seen. No growth obtained on culture.

6th March.—Patient seen by Dr. Cranston Low, who was inclined to agree with the diagnosis of Addison's disease, and advised tablets of suprarenal gland.

(Patient has been getting nuclein lately, but this is now stopped.) The neck wound is now healed and no pus is obtained from the sinus, but there is still pus in the cerebellar abscess. Expectoration as before.

10th March.—Temperature, 98 F. Lumbar puncture; fluid clear and not under pressure. Patient better.

19th March.—Cerebellar hernia is larger and there is still pus in the cerebellar abscess. Patient can now sit up a little. No vomiting. She appears to be gaining weight slightly.

23rd March.—Patient vomited after dinner yesterday, and again this morning.

3rd April.—Temperature now is usually normal. Cerebellar hernia still present; no vomiting; patient still gaining weight. Optic fundus in both sides is practically normal.

22nd April.—Child has been doing well, but to-day complains of severe frontal headache. Temperature up to 100° F. Vomiting yesterday and to-day.

24th April.—Headache and vomiting passed off; temperature normal. The cerebellar abscess is now being dressed with gauze saturated in eusol. The foul odour of the pus from the cerebellar abscess is much less pronounced.

6th May.—Patient still has occasional attacks of headache and vomiting. Temperature and pulse are normal and the tongue is clean.

16th May.—Attacks of vomiting, and headache, localised to frontal region, still continue at intervals. The packing is now omitted from the cerebellar abscess. Report on fundus: there is still some swelling of both discs, indicating increased pressure (Dr. Sym).

23rd May.—The wound behind the ear is now quite healed. There is no headache or dizziness on pressure over the hernia cerebelli, but the pupils dilate slightly when pressure is made. Kernig's sign is still present.

17th June.—Patient has been up for the last few days but is quite unable to walk or even to stand. She at once falls over to the right. To-day for the first time it is noted that there is slight paresis of the right side of the face.

10th September.—Patient has been at home for two months. She reports to-day looking fat and well; she has gained enormously in weight. No sign of facial paresis, but still slight bulging of hernia cerebelli. Girl can walk well and has no difficulty in balancing.

Remarks.—When the patient was admitted the symptoms and signs of purulent leptomeningitis predominated, and lumbar puncture confirmed this diagnosis. The radical mastoid operation was performed and a large extradural perisinus abscess drained. Repeated lumbar punctures showed rapid improvement in the condition of the cerebro-spinal fluid. Within a week the symptoms of leptomeningitis had almost entirely passed off and the cerebro-spinal fluid had become clear. (This may possibly have been due to a want of reaction on the part of the patient, caused by the presence of other intracranial complications.) At the first operation, in view of the state of the vessel wall, the sigmoid sinus was opened just about the region of the upper knee, and was found to contain fluid blood. After the patient had been one week in hospital, when the signs of meningitis were rapidly receding, symptoms suggestive of cerebellar abscess on the diseased side became prominent.

case. the child lay curled up in bed, there was stiffness of neck, the head was supported by the hands, the grasp was feeble on the ipsilateral side, dysidiadochokinesia was present, along with spontaneous nystagmus to the affected side. There were, in addition, symptoms of an otitic venous infection—evening rise of temperature to 104° F. Suddenly the signs of this venous infection became still more prominent: there was a marked rigor. The second operation was performed at this point and showed that the lower part of the sigmoid sinus, jugular bulb, and upper part of the internal jugular vein were thrombosed. This thrombosis had probably been present at the time of the first operation, but had been missed, as the sigmoid sinus had been opened just at its junction with the lateral sinus instead of below the upper knee. All attempts at washing through from the sigmoid sinus to the jugular vein in the neck met with failure, both at the time of the second operation and on subsequent occasions. Immediately after the venous infection had been dealt with the signs of a right-sided cerebellar abscess again asserted themselves—extraordinary nystagmus, pointing error, vomiting, etc. At this period, also, symptoms of gangrene of the lung supervened, evidently the result of a septic infarct. The child began to spit up extremely offensive brownish-red material, which was always more profuse when she was turned on her left side in order that the wound behind the right ear might be dressed. Functional examination of the right labyrinth at this stage showed that it was still active, as the patient was able to hear with the noise apparatus occupying the attention of the sound ear, while the vestibular apparatus on the diseased side reacted to the caloric test. As the signs of cerebellar abscess continued, the dura covering the right lateral lobe of the cerebellum was incised and a stinking abscess evacuated. From this point onward the patient made a slow recovery. The pulmonary abscess continued to discharge foul pus for several weeks, and the signs of increased intracranial pressure—headache, vomiting, changes in the optic fundus, and increase of the hernia cerebelli—were noted from time to time. Lumbar puncture was performed at intervals and showed turbid fluid, with many polymorphs and lymphocytes, and, on one occasion, a bacillus of the *B. coli* group. The cerebellar abscess was all along packed with strips of self-edge gauze, and as long as this was continued there was no accumulation of pus. When, however, the gauze strips were omitted for a day or two, the discharge at once accumulated. The explanation of the marked brown pigmentation of the skin in this case was somewhat obscure. In view of the favourable result the diagnosis of Addison's disease appears very doubtful.

(*Note.*—Owing to the absence of Dr. W. R. Logan on military service, the bacteriological aspect of the two cases is by no means so full as it would otherwise have been. J. S. F.)

RECENT ADVANCES IN MEDICAL SCIENCE.

MEDICINE.

UNDER THE CHARGE OF

W. T. RITCHIE, M.D., EDWIN MATTHEW, M.D., J. D. COMRIE,
M.D., AND A. GOODALL, M.D.

COMPRESSION OF CAROTID ARTERIES IN EPILEPSY.

EASTMAN gives (*Amer. Journ. Med. Sci.*, September 1915) his experience of the results obtained by tying the common carotid arteries for the relief of epilepsy. He operated upon six cases, producing partial compression of both carotids by means of a loop of silver wire tightened up so far as to cause almost complete obliteration of the temporal pulses. In one case, that of a young man of twenty years, who had suffered from five or six attacks of *grand mal* daily, the patient was so far benefited that he suffered only from a few attacks of *petit mal* weekly. Two other cases showed similar alleviation. The writer considers that in view of the extremely unsatisfactory results of non-surgical treatment of general epilepsy the practice of the plan of compression of the common carotids may be considered justifiable, though the procedure at present should be regarded as an experimental one. Obviously, however, an earnest effort to locate and correct any cortical lesion or an existing peripheral source of irritation should precede an attempt to reduce the calibre of the afferent blood-vessels of the brain in general epilepsy.

SYMPTOMS AND TREATMENT OF LEPROSY.

A series of papers by Montgomery, Morrow, Lee, and Chipman (*Journ. Amer. Med. Assoc.*, 7th September 1915) deals with recent views and experience on this disease. As the result of observation of modern cases in California, Lee finds the following symptoms to be the most common:—The skin lesions may be a macular eruption, trophic changes following nerve involvement, or hypertrophic processes located in the corium; the skin becomes leathery, and there is diminution of the perspiration in the neighbourhood of affected areas. The nerve trunks may be greatly enlarged and the small cutaneous nerves may become not only palpable but visible. Contractions come on, the "leper claw" being one of the commonest features. Rarefying osteitis in the bones of the limbs may cause the production of "stumps" without ulceration; but again the appearance of bullæ and chronic ulcers on the skin is also common. Hoarseness, due to lesions in the larynx and pharynx, is also common, especially where nodular

eruptions are present on the face. Leprosy of the eyes, shown by excessive lachrymation and distortions of the lids, and ulceration of the cornea, is very common. As regards modern views on the causation, the idea that the eating of diseased fish is responsible finds fewer and fewer adherents, while the theory that direct inoculation from person to person is responsible is negatived by the failure of numerous human and animal experiments. Currie, working in Hawaii, concluded that mosquitoes feeding under natural conditions on patients with nodular leprosy rarely, if ever, imbibe the leprosy bacillus, and that they can be excluded as the ordinary means of transference of this bacillus. The same observer, however, found that certain varieties of flies, when given an opportunity to feed on leprosy fluids, will contain the bacilli in their intestinal tract for several days; the bed-bug and the acarus of scabies have also fallen under suspicion, the latter especially, because in Heiser's series of cases 55 per cent. of cases of leprosy were found to have had scabies at a previous period. The ability of the leper to transmit the disease varies greatly with its phase, the most important cases to segregate being those in the active nodular stage. While the disease is associated with dirt and with semi-civilised conditions of the community, infection by close proximity, as from husband to wife, or patient to attendant, seems not to take place. As regards treatment, while the use of immunising serums would by analogy seem hopeful, no such serum has yet been found; similarly, vaccines like those of Clegg and Duval have been found useless. Tuberculin, which produces a reaction in leprosy patients, has been found to make the condition worse; and leprolin, an analogous substance made from the leprosy bacillus, has been found useless. Nastin, a fatty substance extracted from streptothrix, cultivated from cases of nodular leprosy, combined with benzoyl chloride, upon injection into lepers is capable of causing bacteriolysis, but nothing further has come of it. Salvarsan has had extensive trials, but is of about the same effectiveness as arsenic. Radiotherapy, while influencing individual nodules favourably, appears to disseminate the bacilli and so to favour the spread of the process, and is condemned. Chaulmoogra oil is the one substance which has best stood the test of time. Heiser, using in the Philippine Islands the following mixture:—Chaulmoogra oil, 60 parts; camphorated oil, 60 parts; resorcin, 4 parts, obtained the following results:—Apparent cures, 11 per cent.; apparent clinical recoveries, 41 per cent.; showing improvement, 33 per cent. He injects this substance subcutaneously in weekly doses of increasing amount, beginning with 1 c.c.

SYPHILIS OF THE STOMACH.

Smithies (*Journ. Amer. Med. Assoc.*, 14th August 1915) states that syphilis of the stomach is probably by no means so uncommon as

medical writers of a decade ago made out. He states that previous to the last six years he had found references in medical literature to only seventy authentic cases ; within this period he had found records of twenty-five cases in the United States alone ; while he himself now gives twenty-six cases personally observed. This recent prevalence he attributes to the new use of serologic tests in the diagnosis of obscure abdominal conditions. The twenty-six cases occurred among over seven thousand persons complaining of dyspeptic symptoms, an approximate frequency therefore of one case due to syphilis in every three hundred gastric cases. Fifteen cases occurred among male, eleven among female patients, and the age varied from 20 to 66 years. Of the twenty-six there were five cases in which no history positive for, or even suggestive of, primary infection could be obtained, but in all the Wassermann and Noguchi tests were definitely positive. With regard to the symptoms complained of, dyspepsia had lasted on an average for eight and a half years, the minimum duration being six months ; the usual symptoms were suggestive of a peptic ulcer, with epigastric pain and tenderness in the right upper quadrant of the abdomen and marked loss of weight, which on the average amounted to over 17 pounds for the three months preceding the first consultation. In four instances there was a palpable epigastric mass. In only one case was free hydrochloric acid absent, while in one case it was as high as 110, the average acidity being total, 39.7, free hydrochloric acid, 9.8. With regard to the Röntgen ray examination, a diagnosis of chronic peptic ulcer or suspicious ulcer or tumour was returned in eight instances ; but the only valuable diagnostic sign obtained from this method of examination is when the anomalous finding is obtained of a gastric tumour along with a high degree of peristalsis and a normal condition as regards test meals. In five of the cases here recorded an exploratory laparotomy was performed with the following results : —three instances of smooth, pale, callous ulcer ; one profuse infiltrating hard growth ; and one smooth hard mass, the size of a lemon, at the pylorus. As regards treatment, the writer recommends salvarsan intravenously, followed by a thorough course of mercury, but he gives the warning that one should be cautious as regards the promise of a cure.

J. D. C.

SURGERY.

UNDER THE CHARGE OF

J. W. STRUTHERS, F.R.C.S., AND D. P. D. WILKIE, F.R.C.S.

AUTOPLASTIC REPAIR OF RECENT FRACTURES.

C. DAVISON and F. D. Smith (*Surg., Gynec., and Obstet.*, September 1915) contribute an article on the use of bone grafts in the treatment of

recent fractures. The authors maintain that bone grafts possess great advantages over metal plates, and they believe that eventually the Lane plate will no longer be used in the repair of recent fractures. Foreign bodies invariably produce a certain amount of pressure necrosis, absorption, and disintegration of tissue, and by lowering vitality favour infection. Autografts, on the contrary, are treated kindly by the tissues, and are living, osteogenic structures, which heal in as an integral part of the body.

Operative treatment in limb fractures is only recommended when ordinary methods have failed to effect reduction and to maintain proper alignment. It is in these cases that autoplasmic repair proves of great value.

The mode of application varies according to the site of the lesion. In fractures of the shafts of long bones the graft is inserted as a medullary splint. In fractures through cancellous tissue the graft is inserted across the line of fracture through the cancellous tissue, and the ends of the graft brought into actual contact with the cortical compact bone of each fragment. The transplant should be devoid of periosteum, as periosteum, being a fibrous membrane, tends to retard osseous fusion.

It has been observed that a medullary transplant occasionally undergoes early absorption. In some cases this may be due to the employment of antiseptics which destroy the delicate cells of the graft. In a few cases it is possible that a specific autolytic ferment is formed which dissolves the foreign tissue proteid. The vast majority of transplants, however, live and take a part in the functional support of the extremity.

In about thirty days the ends of the graft become firmly united to the compact bone, and after several months there is complete fusion between the transplant and the adjacent tissues. The changes observed when the graft is placed in cancellous bone are regarded as specially noteworthy. Around the graft new trabeculae develop, and the bone becomes denser. If there be little cancellous tissue between the graft and the cortical layer of the fractured bone, the whole area is transformed into compact osseous tissue.

The medullary splint is not a permanent entity. After the fragments are firmly united by callus the transplant and the condensed tissue around it lose their functional value and accordingly begin to atrophy. Finally, the original structure of the bone is restored. It was found that a transplant placed in the medullary cavity of the humerus was completely absorbed in two to five years, the period depending upon the size of the graft and the age of the patient.

MILITARY SURGERY.

Cranial Injuries Produced by Shell Fragments. — R. Leriche (*Lyon Chirurgicale*, September 1915) gives an account of 397 cases of non-

penetrating wounds of the skull, and details the clinical findings and the routine treatment adopted.

The character of the scalp wound was found to be of little value in determining the extent of deeper lesions, as the most trivial wound not infrequently was accompanied by gross injuries to the skull and cranial contents. Further, the outer table in many cases presented little or no evidence of injury, yet the vitreous was extensively fractured, the dura mater torn, and the brain contused. Minute fragments of shell occasionally caused wounds which led to meningitis or cerebral abscess.

In view of these facts the author deems it advisable to perform an exploratory operation in every case. His method of procedure is as follows:—Under ethyl chloride anæsthesia a crucial incision is made and the corners of the flaps raised by artery forceps. Should the exploration be negative, the flaps are replaced without sutures and dressings applied. The same evening or the following day the patient is sent to the base. If there be the slightest evidence of bone injury—a mere abrasion or a bluish or red discoloration—the anæsthesia is prolonged by chloroform and the skull trephined. Should the inner table be splintered, the opening is enlarged and the fragments removed. Many cases, in which absence of brain pulsation and discoloration of the dura indicated cerebral contusion and hæmorrhage, were further explored by opening the dura. The results obtained, however, were not satisfactory, and it is strongly recommended never to open an intact dura. When the dura is torn, the parts are carefully cleansed and the opening enlarged to improve drainage. Gauze packing is introduced and retained without changing for a considerable time. In these cases the convalescence should be long and the prognosis guarded.

Lumbar puncture, contrary to expectation, was found to be of little diagnostic value. As a rule, there was hypertension and discoloration of the cerebro-spinal fluid, indicating the presence of foci of cerebral contusion. Strong evidence is adduced to prove that, in many cases, such foci are caused not so much by the projectile itself as by the effects of the explosion.

Although lumbar puncture has no real diagnostic value, it is considered a therapeutic measure that should be frequently employed. If there be hypertension, the withdrawal of cerebro-spinal fluid every two or three days renders the conditions more favourable for the repair of nerve tissue, and always results in the amelioration of such symptoms as torpor, headache, and bradycardia.

Nerve Lesions Produced by Shell and Mine Explosions.—R. Leriche (*ibid.*) records his observations made in a series of cases suffering from the effects of shell and mine explosions. The clinical features presented were very diverse. In some cases there was merely lassitude, persisting

for a variable period. More frequently there was some form of paralysis, while in others there were manifestations of cerebral concussion.

Many have attributed such symptoms to psychic or emotional derangement. The author, however, believes the majority are organic in origin. The cerebro-spinal fluid was found to be under increased tension, and in those cases seen early there was a definite hæmic discoloration. In one case the author had the opportunity of demonstrating the appearance of the brain. The patient had been subjected to the influence of a shell explosion, and subsequently developed Jacksonian epilepsy and brachial paralysis. The skull was trephined, and there was found to be cerebral œdema with numerous hæmorrhagic foci.

Here, again, lumbar puncture is recommended as a therapeutic measure. One case is cited in which there was melancholia, stupor, and slowing of the pulse. Three lumbar punctures resulted in the entire disappearance of all the symptoms.

Compound Limb Fractures.—Tuffier (*Surg., Gynec., and Obstet.*, September 1915), in the course of a short review of his experience of military surgery during the past year, makes mention of an apparatus which has yielded excellent results in cases of limb fractures.

Flannel bandages are first applied to protect the skin, and the bony prominences are carefully padded. Strips of metal, bent into the form of loops, are then placed over the site of fracture and the extremities of the loops fixed above and below by plaster-of-Paris bandages. This simple and light apparatus ensures absolute immobilisation and renders dressing easy.

The uncovered wound should be treated by free drainage and irrigation. Conservative treatment is strongly recommended, and amputation is only considered justifiable when the life of the patient is in imminent danger.

J. N. J. H.

DISEASES OF CHILDREN.

UNDER THE CHARGE OF

G. H. MELVILLE DUNLOP, M.D., W. B. DRUMMOND, M.B.,
AND A. DINGWALL FORDYCE, M.D.

PROPHYLACTIC INOCULATION.

HESS (*Pediatrics*, May 1915) describes an experiment carried out in the Hebrew Infant Asylum with the object of cutting short an epidemic of mumps by means of inoculation. Twenty children who had not had mumps before were inoculated with the blood of convalescent children, using 6 to 8 cm. of the blood from the vein of the elbow of the donor and injecting it intra-muscularly. These twenty

children were divided into three groups: those of the first group were inoculated with the blood of patients who had just recovered and in whom there was still some swelling of the parotid; the second group were inoculated with blood from patients about ten days recovered from the disease; while in the third group blood from children who had the disease several years ago was used. The injections were made when the epidemic had reached considerable proportions. All the children were then exposed to the mumps in the mumps wards. In all the wards in which the children were exposed mumps occurred to a considerable extent after these children were exposed, but not one of the inoculated children contracted the disease. In one ward eleven susceptible children contracted the disease, while not one inoculated child did so. Hess is convinced that the epidemic was limited as a result of this method of inoculation and that the method is a simple preventive of mumps in an institution.

Dr. Sophia R. Rabinoff (*Pediatrics*, July 1915) has experimented with prophylactic vaccination during an epidemic of varicella in the Hebrew Infant Asylum of New York. The material used was taken directly and immediately from either vesicles or pustules. The results were striking. Among the entire group of 142 susceptible children, 114, or about 75 per cent., developed varicella, while in the group of 76 vaccinated children only 6, or 8 per cent., contracted the disease. Of these 6 cases 2 developed on the day following vaccination, 2 seven days later, 1 nine and 1 ten days later. In other words, all the cases among the vaccinated children developed within the incubation period of the disease, which was about 16 days. In this epidemic the vaccination undoubtedly limited the spread of the disease and can be recommended for use in similar institutions in the presence of an epidemic as well as in selected cases in the home.

Herrman (*Arch. of Pediatrics*, July 1915) contributes a paper on immunisation against measles in which he expresses the opinion that the present high mortality from measles can only be distinctly diminished by immunisation against the disease. Young infants, he says, are insusceptible to measles. Infants who have been exposed to measles often escape when exposed at a later date. Examples of this are given. Upon these facts he bases the thesis that if infants under five months were inoculated with measles they might be expected to develop enhanced resistance to the disease. Herrman has had the courage of his convictions, for he inoculated 40 infants under five months of age with nasal mucus obtained from children 24 hours before the measles rash appeared. The inoculations were made by preference between the fourth and fifth months, because, as the immunity was not absolute at that time, it seemed more likely that the organism would react with the formation of antibodies. The majority of the infants had no distinct reaction; 15 had a slight rise of tempera-

ture—from 100° to 101°—varying in its appearance in different cases from the eighth to the fourteenth day. In a few instances a small number of spots were noted on the face or body, varying in the time of their appearance from the fourteenth to the eighteenth day; but these were so few and indistinct that they would ordinarily have escaped detection. Of the 40 cases inoculated, 4 over one year of age have since come in contact with cases of measles and have not contracted the disease. In addition, by way of experiment, 2 of the 40 cases were reinoculated at the age of twenty-one and twenty-three months respectively. In both the result was negative. Herrman concludes that the method he describes presents a safe and simple means of immunising against measles.

INFANT FEEDING.

The subject of infant feeding is of perennial interest, and recent papers show that percentage feeding and the use of undiluted citrated milk continue to have their advocates. An editorial in the *Archives of Pediatrics* (November 1914) upon the purity of cows' milk is encouraging as showing that in New York a clean bottled milk (grade B milk) can be sold for six cents a quart. This milk is pasteurised, and must be sold within thirty-six hours of milking. The statement is certainly remarkable considering that wages are much higher in the United States than with us, and should help to stiffen the demands of those who are trying to improve the cleanliness and purity of milk as it is sold in Britain.

The most novel method of treating milk is described by Ladd (*Arch. of Pediatrics*, June 1915, and *Boston Med. and Surg. Journ.*, 1st July 1915) in two articles dealing with homogenised milk. The homogenisation of liquids consists in reducing their constituent elements into such a physical condition that they will no longer separate but will maintain a permanent and even composition throughout the mixture. The mechanical device by which this result is made possible is the invention of M. Gaulin of Paris. The essential feature of his machine is an agate valve so finely ground that it will leak only under great pressure, and held in its bed by a variable tension spring which is regulated by a fly-wheel with a screw end. The process of homogenisation does not affect the chemical composition of the milk, but the physical condition is so changed that the cream does not rise nor can the fat be separated by the ordinary cream separators. The process decidedly improves the taste of the milk or cream, particularly that of pasteurised milk. Moreover, when the milk has to be transported long distances in warm weather the tendency of the cream to rise and form oil droplets is obviated. In addition, the process has a beneficial effect upon the keeping qualities of milk and milk mixtures. This effects an important economy in the case of children who are

being fed upon milk mixtures supplied from a milk laboratory at a distance, because instead of sending a daily supply it is sufficient if a supply be sent twice a week. The most interesting application of the principle of homogenisation is in connection with the fat constituent of milk modifications, especially in cases of so-called fat intolerance. These cases are amongst the most difficult ones with which the paediatrist has to deal, and Ladd describes some cases of special difficulty in which he has experimented by substituting a vegetable fat, such as olive oil, for the fat of the milk. Olive oil was chosen because olein is the principal fat of breast milk. Various percentages of olive oil were given in mixture with skim milk, or precipitated casein, or fat-free lactic acid milk, or malt soup, the mixtures all undergoing the homogenising process. In the case of the malt-soup-olive-oil mixtures the tendency for the barley decoction to separate on standing was strikingly prevented. Ladd considers that the results obtained by him in difficult cases were very satisfactory, and that a wide field is open to determine the indications and limits for the method.

AMAUROTIC FAMILY IDIOCY.

Coriat (*Boston Med. and Surg. Journ.*, 1st July 1915) calls attention to some new symptoms in amaurotic family idiocy. The symptoms are: *explosive laughter*, noticed in three cases; *hydrocephalus* in four reported cases; *bulbar symptoms* in one case which died suddenly from bulbar paralysis; *nystagmus* in three cases; *hypotonia* reported in several cases; *abnormal reflex phenomena* in several cases. Of the last mentioned Coriat says that hyperacusis has long been known, and appears to be present in nearly all cases, at least in the early stages; but he has noticed another abnormal reflex phenomenon, which he has not seen described, namely, increased sensitiveness to light and to tactile stimuli. The child affected was very much in the condition seen in a frog poisoned with strychnine or in decerebrate animals. He considers that the phenomena are probably irradiative and show that certain inhibitions in the receptive mechanisms of the central nervous system are at fault. This irradiation of reflexes corresponds to the causes of irradiation in long spinal reflexes, as shown by Pflüger's second law.

BIRTH PALSY.

Two opposing theories have been brought forward to explain the etiology of birth palsy (Erb's paralysis). These are—(1) Primary paralysis due to stretching or tearing of the brachial plexus. (2) Primary joint or bone lesion, with or without secondary paralytic phenomena. These two theories are discussed by Platt (*Brit. Med. Journ.*, 8th May 1915). He states that it is quite an established fact that subluxation of the humerus is associated with the majority of cases of moderate severity. The theory that the paralytic symptoms

are secondary to a primary joint or bone lesion has recently been strongly advocated by Turner Thomas of Philadelphia, who has brought forward a new conception of the mode of production of the injury. Thomas believes that in all cases the joint capsule is damaged, and, in addition, in the majority of instances, an actual subluxation is produced at the time of birth; this subluxation is difficult to diagnose, and therefore is invariably missed in the first few weeks. The resulting scar tissue from the lacerated capsule involves the brachial plexus cords lying in close proximity to the shoulder joint, causing paralytic phenomena which are usually slight and transient. The violence producing this shoulder joint injury is not traction during delivery but pressure exerted by the bony pelvic wall on the anterior aspect of the infant's shoulder while it is still *in utero*. According to the degree of backward pressure there is either a tearing of the joint capsule or a subluxation of the joint. Platt considers that there is at present scanty evidence to support the theory expounded by Thomas, but that there is a certain amount of evidence in favour of a primary epiphyseal or joint lesion in some cases of obstetrical palsy. It is probable, he thinks, that the combination of physical signs presented in birth palsy may be produced by a pure plexus lesion, a joint lesion, or an epiphyseal displacement. The differential diagnosis of the three conditions in a very young infant, however, is well-nigh impossible. Thomas' theory is also discussed in an article by Sever (*Boston Med. and Surg. Journ.*, 1st July 1915) on paralytic conditions resulting from surgical and obstetrical accidents. He agrees with Platt that the theory is supported by very little evidence. He says that though it is perfectly true that later, as the child grows older, there is in many cases a posterior subluxation of the head of the humerus, accompanied by bony deformity of the clavicle and acromion, early cases of his own and of others with larger experience have never shown this condition, and he points out that congenital dislocation of the shoulder is not accompanied by brachial paralysis. With regard to treatment, both Platt and Sever agree that the best results are likely to be obtained by fixing the arm without delay in the position of relaxation of the paralysed muscles—that is, abducted to 90°, and rotated out fully at the shoulder, flexed to a right angle at the elbow with the forearm fully supinated and the wrist and fingers hyperextended. This can be done by means of a plaster-of-Paris shell or a tin or aluminium splint. Sever states that some persons with long experience in the treatment of these cases say that it is not wise to fix the arm of a young baby in such an apparatus, lest the child should become obsessed with the fact that the arm cannot be used, and progress will be delayed and the end result will not be good. For his own part he considers that an arm in as good an anatomical condition as it may be possible to make it will finally be a more useful arm than one which has been fixed in inward rotation

through contraction, together with more or less posterior subluxation of the shoulder joint, as is almost always seen in the older cases. Corrections of these two deformities, together with osteotomy of the acromion which frequently grows down in front of the head of the subluxated humerus in older cases and prevents its full replacement, generally results in material improvement; but why not prevent the necessity for this procedure by taking the proper precautions at the beginning?

CHYLOUS ASCITES IN CHILDREN.

A paper on this subject is published by Comby (*Arch. de Med. des Enfants*, June 1915), who draws attention to an important work by Gandin of Petrograd on the pathogenesis and classification of the condition (*Ergeb. d. inn. Med. und Kinderh.*, 1913, Bd. xii. S. 219), giving 281 references to medical literature. Cases of chylous ascites are usually divided into three groups: (1) True chylous ascites caused by the presence of chyle in the effusion. (2) Chyliform or fatty ascites which resembles the first but is due to fatty degeneration of the cellular elements present. (3) Opalescent ascites, in which the fluid has a milky appearance. The latter form is generally supposed not to result from the presence of fat but to be attributable to fine particles of albumin, nucleo-albumin, mucus, lecithin, lecitho-globulin, etc. Gandin does not think this differentiation of chylous or chyliform ascites into different types rests upon any solid basis whatever. He states that the chyle is the sole known source of finely emulsified fat within the body, and that milky and opalescent effusions should be regarded as chylous in nature. The terms chyliform and pseudo-chylous do not represent any pathological entities and are superfluous. When fat is present not in the form of an emulsion but in droplets the effusion does not present a milky appearance.

Comby goes on to quote from the *American Journal of Diseases of Children* (July 1914) a case of acute chylous ascites of the pseudo-chylous or milky type in a boy eight years of age, described by Huber and Silver. This case was treated unsuccessfully by aspiration, several litres of milky fluid being drawn off. It was then decided to perform an exploratory laparotomy. The only anomaly discovered was that the lacteals of the intestines and the mesentery were greatly dilated and varicose. Drainage of the peritoneal cavity was carried out by means of several series of silk threads, one end of which was left just within the peritoneum while the rest of each thread was insinuated into the subcutaneous tissue of the abdominal walls. This procedure proved successful, the child making a rapid recovery. The silk threads not only effected rapid absorption of the ascites without harm to the child, but in fact assured retention within the body of a fluid rich in nutritious material.

W. B. D.

MENTAL DISEASES.

UNDER THE CHARGE OF

JAMES MIDDLEMASS, M.D.

TESTS APPLIED TO SPINAL FLUID IN PSYCHIATRY.

DRS. WESTON, Darling, and Newcomb report the results of a series of tests of the cerebro-spinal fluid in 198 cases of mental disease (*Amer. Journ. of Insan.*, April 1915, p. 773). Besides the Wassermann and Noguchi tests the number of cells was counted, the globulin content estimated, and the Zsigmondi colloidal gold test was applied. The last is comparatively a new method, and it is of interest to compare the results found by it with the older and better-known ones. The test depends on the power of proteins when in excess to precipitate gold from a specially prepared colloidal solution in sodium chloride. The technique is elaborate, and the greatest care is required in the preparation of the reagents employed. Lange in 1912 ascertained that it is a sensitive test of the presence of syphilitic affections of the cerebro-spinal system, and since his time various other researches have been conducted on the same lines. The present report describes the technique and gives the results of over 200 tests. Of the cases investigated 3 were of syphilitic cerebro-spinal disease, 34 were general paralytics, and the rest various other forms of mental disease. The results of each test are given. The conclusions at which the authors arrived were as follows:—

1. In cases diagnosed as cerebro-spinal syphilis the Wassermann reaction upon the spinal fluid was always positive, and the colloidal gold test showed a reaction.
2. In general paralysis the gold test was always found positive in cases where the spinal fluid showed a similar reaction to the Wassermann test, in addition to which there is one instance in which the latter was negative and the former positive.
3. In dementia præcox, manic-depressive insanity, arteriosclerotic dementia, and epilepsy there were no positive Wassermann reactions, and likewise no typical response to the gold solution. The latter reagent, however, did furnish 8 cases showing a minor reaction.
4. In the unclassified psychoses the gold and Wassermann tests ran a parallel course except in one case. In this case also the former gave a minor reaction, whilst the latter was negative. This was clinically a possible case of paresis.
5. From this investigation the conclusion is drawn that the gold reaction forms a useful adjuvant to the Wassermann test, is apparently as reliable, and in some instances has appeared to anticipate the latter.

THE CATATONIC TYPE OF DEMENTIA PRÆCOX.

In this paper Dr. Dunlop Robertson advances a number of propositions which lead him to the conclusion that this type of dementia præcox is due to an adrenal intoxication (*Journ. of Ment. Sci.*, July 1915, p. 392). He quotes an extensive array of authors who lead him to this view, but it must be said that the most of these opinions are at the best too speculative to carry any great burden of proof. He is able to refer to only a single experiment of his own which is at all confirmatory of his hypothesis. The blood of two patients—one catatonic, the other not—was taken, allowed to coagulate, and equal quantities of each were tested with a few drops of a saturated solution of potas. bichrom. In the former a deep coloration was produced, in the other not. It is not stated that this test is specific for adrenalin; and as it is known that blood-serum is a most complex mixture of organic and inorganic substances, the greatest care is necessary in interpreting the significance of a single reaction. In this particular case it is interesting to note that the cerebro-spinal fluid did not react to the same test. One would imagine that it would be probable, but not of course certain, that if one reacted to the test the other would also. Another point which the author does not seem to dispose of satisfactorily, though he refers to it, is the low blood-pressure usually found in these cases. If adrenalin is present in excess in the blood one would expect the pressure to be raised at least in the early stages of the illness. Such has not proved to be the case, however. It may possibly be, as the author suggests, that a great excess of adrenalin may have a paralysing and not a stimulating effect. Such contradictory results are known in connection with other organic substances. It would, however, appear to be capable of definite experimental proof. The views put forward by Dr. Robertson may ultimately prove to be correct, but much more observation is required before they can be accepted as proved.

THALAMIC GLIOSIS IN DEMENTIA PRÆCOX.

In this paper (*Amer. Journ. of Insan.*, July 1915, p. 103) Dr. Mary E. Morse gives the results of a pathological investigation of the thalamus in a series of cases of dementia præcox. She chose this part of the nervous system because it has a close relation with sensory impulses passing to the cortex, with the cerebellum, and with the sympathetic system. A short account is given of what is known of the development and minute anatomy of the thalamus. The cases investigated by the authoress were from the Worcester State Hospital, and included 10 cases of dementia præcox who died at an age when arteriosclerotic and senile changes could be excluded, and were uncomplicated by other recognised nervous lesions. Brief clinical abstracts of these cases are reported, and the pathological findings as well. The methods

of examination and the positions from which sections were taken are also described. Eleven control cases were examined in an exactly similar way, and the results of the examination of these are given as well.

As a general result of the whole investigation Dr. Morse states that the distinctive change in the thalamus in dementia præcox is a gliosis. Degenerative changes in the nerve cells and perivascular accumulation, when present in the thalamus, were also found in the cerebral cortex, except in a few cases. In these perivascular infiltration was confined to the thalamus. This thalamic gliosis occurs more frequently in dementia præcox cases than in the case of other psychoses who die at about the same ages. A marked gliosis may occur in the thalamus in dementia præcox at a period when there is little gliosis in other parts of the nervous system. In none of the cases was the gliosis strictly limited to the thalamus, but in the majority of those in which it was present there it exceeded that found elsewhere. The areas most frequently involved are the median nuclei and the pulvinar. The age at death and the duration of the psychosis have a marked influence on the occurrence of gliosis. Those in which it was absent or slight (4 cases) were under 40 years of age, and the psychosis had not existed more than a year. When the patient was advanced in years and the disease was of long duration (2 cases) the gliosis tended to be very marked both in the thalamus and in other parts of the nervous system. In the intermediate group (4 cases) the disease occurred in the fifth and sixth decades, and it had been in existence from three to five years. The interpretation of the lesion and its relation, if any, to the symptoms are problematical.

THYMUS AND PITUITARY IN DEMENTIA PRÆCOX.

Drs. Ludlum and Corson White have investigated the Abderhalden reaction to testicle and pancreas in cases of dementia præcox, and found it positive in certain of them (*Amer. Journ. of Insan.*, April 1915, p. 733). These cases presented certain physiological characteristics, such as leukopenia, increased blood-pressure, feeble and rapid pulse, exaggerated reflexes, tremor of tongue and extremities, etc. In seeking an explanation of these apparently correlated symptoms they were led to associate them with the condition of the thymus, partly as the result of investigation of the Abderhalden reaction in two thymectomised dogs, partly from a study of the views of various authors on the physiology of the thymus. On this supposition they treated six cases with thymus gland extract, and three recovered satisfactorily.

In certain other cases giving no Abderhalden reaction they found another group having a different aggregate of symptoms. These had a very low blood-pressure, which fell on standing (contrary to the general rule); the pulse was slow; the deep reflexes were diminished,

sometimes absent; the temperature was subnormal, sometimes 2° ; and the testicles were small. Reasoning again, from the known symptoms produced by deficiency of secretion of one of the glands of internal secretion, they concluded that the above were due to dyspituitarism. Under treatment with pituitary gland most of these cases showed improvement. In still another series of cases the symptoms generally seemed to point to hyperpituitarism. These were treated with testicular extract or Brown-Séquard fluid, and in them also there was a rapid subsidence of the mental symptoms.

In the authors' opinion the study of the glands of internal secretion should be further pursued as being likely to lead to a better knowledge of dementia præcox.

CERTIFICATION UNDER THE MENTAL DEFICIENCY ACT.

A short but interesting paper by Dr. Potts, Medical Officer to the Birmingham Committee for the Care of the Mentally Defective, will repay perusal by those upon whom the recent Act has placed the responsibility of examining mental defectives (*Birm. Med. Rev.*, May 1915, p. 129). Dr. Potts is specially qualified to speak with authority on this subject, as he was for ten years chairman of the Birmingham After-Care Committee, which dealt with many mental defectives voluntarily before the Act made this a duty.

The first part of the paper gives a short account of the persons brought under the Act, and need not be further referred to. The second gives many useful hints in the examination of patients with a view to certification. The main evidence of defect must of course be based on facts ascertained by the medical man at his own examination of the patient. It is well to have a systematic method of ascertaining these facts, and they are best arranged under the headings of appearance, conduct, and conversation. Marked stigmata of degeneration, especially if there are several, are permissible under the first. As to conduct, it is often the only basis of the certificate. This should be closely observed during the whole of the examination. It assists materially in the estimation of intelligence, which, however, comes chiefly under the third heading. Certain special tests are mentioned as ready examples of simple methods of ascertaining the intellectual development of the patient, and these of course must vary with age. Samples are also given of statements in actual certificates which illustrate the sort of facts which have complied with the requirements of the Act and have stood the test of practical experience. A caution is uttered as to the necessity of eliminating the effects of physical conditions which influence the results of the examination but are not evidences of mental defect. Such are slight deafness, physical illness, hunger, etc. It is highly necessary to keep these in mind when persons belonging to classes in which these conditions are common are dealt with. It will be seen that the paper well repays perusal. J. M.

DERMATOLOGY.

UNDER THE CHARGE OF

W. ALLAN JAMIESON, M.D., LL.D., AND R. CRANSTON LOW, M.B.

THE LOCAL TREATMENT OF ECZEMA.

GOUGEROT has an admirable paper on this subject (*Progrès médicaux*, 4th April 1914) which is well worth reading *in extenso*. He says that it should follow a certain number of rules. The first is not to do harm. One should distrust unseasonable interference. One ought to proceed tentatively, advancing little by little from a slightly active remedy to one more powerful. When venturing on a new one, this should only be applied to a portion of the area not larger than a crown piece. In this way, should it prove too strong, this will be evident at once, and ulterior injury avoided. The second rule is to select a local application adapted to the case and to the stage of the eczema. In the first stage eczema is sensitive and difficult to deal with, as anything may irritate. The fundamental principle to pursue is an antiphlogistic one, and it is preferable to use water in some form. That most generally applicable is by spray employed three or four times daily for fifteen to twenty minutes each time. As a rule, pure boiled water should alone be used, though if desired such soothing and inoffensive fluids may be substituted as infusion of poppy-heads or of elder-flowers. Saline substances, even boric acid, must not be added. An ordinary throat-spray producer is sufficient. The propinquity depends on the nature of the case. In irritable kinds spray from a distance. In the intervals between spraying a powder should be put on. This may be either of talc or starch. The former suits surfaces best, the latter folds. In drying the part previous to powdering, mop but do not rub. Some eczemas will not endure powdering; we must then have recourse to a fatty application. The grease *par excellence* is pure fresh lard. To this may sometimes be added the neutral subnitrate of bismuth, in proportion of one-thirtieth to begin with. If the antiphlogistic treatment as above described suits, continue it. If not, while going on with the spraying, in the intervals employ a paste thus compounded:—Powdered talc, oxide of zinc, and sweet almond oil, equal parts. Or tar may be tried. The most appropriate is washed coal-tar, used pure. In cold weather, if too thick, melt in a water-bath. If there is still oozing, a preliminary painting with a watery solution of nitrate of silver, one in thirty, is advantageous. To remove the tar use vaseline or oil of sweet almonds. In the third or scaly stage tar may be added to the zinc paste.

TREATMENT OF FROST-BITE BY THE BIOKINETIC METHOD OF JACQUET.

Courcoux (*Presse médicale*, 21st January 1915) says that the moist and persistent cold to which troops long stationed in trenches without

movement are exposed is the cause of many cases of frost-bite of the lower extremities. The greater part has been only frost-bite of the first or second degree. The treatment demanded recalled to his mind a plan advocated by Jacquet, and this has proved more than encouraging. The principle consists in "active movement of the limbs involved during enforced elevation." The patient himself executes these movements of his frozen members placed in a position of compulsory elevation, and as energetically as possible. Following these views, his mode of treating frost-bite is thus:—The frozen limbs are first carefully cleansed with warm soapy water, then, after drying, moistened lightly with a mixture of equal parts of glycerine and alcohol, to which is added 5 per cent. of formol. This lotion, renewed night and morning and allowed to dry, has seemed to him to harden and to antisepticise the epidermis, and, by anticipating excoriations, obviates cutaneous infection. The spaces between the toes are specially attended to, and the toes bandaged separately. If there are blisters, these details must be minutely observed. The lower limbs are now raised and the feet placed as high as possible above the level of the bed. It is easy to improvise an arrangement which enables the patient to keep the legs elevated. He must be taught the various gymnastic motions he is to practise, and these must be carried out by himself. The slightest contact, the least attempt at massage, often rouses severe pain, while the movements made by himself are painless. At first the stiffened limbs can only be moved with difficulty. Hence the motions should be simple—to bend and extend the foot, to turn the ankle out and in. But little by little the joints grow supple; the toes can be curved and flexion increases in force and amplitude. This auto-massage should be persevered in for four or five successive minutes, and repeated from eight to ten times daily. The first result is diminution, even cessation, of the painful crises, which vanish in course of a few days. The œdema also rapidly disappears; walking becomes possible and aids progress. This method has proved eminently satisfactory in his hands.

TAFFETA-CHIFFON AS USED FOR THE CURING OF BURNS AND EXTENSIVE WOUNDS OF THE SKIN.

Alglaive (*Presse médicale*, 11th March 1915) remarks that the views which he expresses apply in particular to burns and superficial lesions. They rest on numerous observations made in the Paris hospitals during twelve years, and recently on the wounded in war. He found that whatever was the nature of the agent with which the compresses of gauze applied directly to the surfaces of the wound had been moistened, it constantly happened that when the dressing was renewed the patient complained of pain, more or less acute, while there arose a bleeding, varying in amount, over the surface. The pain experienced leads the sufferer to dread the necessary manipulation. Besides the bleeding,

the compress, by its adhesion, when taken off is apt to detach the young epithelium, more especially at the advancing margins of repair. For these reasons the idea occurred to him in 1901 to place over the wound a layer of taffeta-chiffon. This is prepared by coating a fine muslin with linseed oil. It is, in fact, an oiled cotton fabric in place of an oiled silk. When this is used as described, not only is the pain abrogated, but no bleeding arises when the dressing is changed. One finds a variable quantity of a sanious puriform fluid investing the surface. When this is bathed off fine granulations are visible, while at the edges a white line of epidermis daily advances, marking the progress of healing. The process is thus carried out:—Taking a burn or other traumatism, this is bathed freely with warm boiled water, to which 10 per cent. of oxygenated water may be added should there be fever. The neighbourhood can be cleansed with alcohol or ether. When in order, the wound is covered with a piece of taffeta-chiffon, previously sterilised in hot water. The piece should slightly overlap the area. Above the taffeta are put some pieces of absorbent gauze and a layer of absorbent cotton-wool, both carefully sterilised. The dressing ought to be renewed daily, and the wound exposed to the air for ten minutes between cleansing and applying the dressing. This activates the granulation. This method has been found to give quite surprising results in burns and in other lesions of continuity, even if of some depth.

HYPERTRICHOSIS IN THE INSANE.

Ewart (*Lancet*, 29th May 1915) notes that anyone with an observant eye, who happens to pass through the wards of an asylum, cannot help being struck with the number of female patients showing an excessive overgrowth of hair on the face—a number much larger than can be seen in any haphazard collection of women selected from the everyday world. The overgrowth is not a mere pencilling of down, but consists of well-defined hirsute appendages, while the development of those affected is a robust one. Of ten marked instances in the Claybury Asylum at present, the type of insanity is a depressional one. He suggests that the secretions of the suprarenal glands may be important factors in causation. Going over the various glands, as regards the ovaries and testicles, the initiation of their functional activity is characterised by increased growth of hair, but to the cessation of their function the augmented hairiness in women cannot be wholly ascribed. When there is a diminution of secretion of the thyroid gland, the hair of the scalp becomes scanty and prematurely grey, with falling-off from the eyebrows, axillæ, and pubes. Under thyroid medication the hair grows again. The cortex of the suprarenal glands does seem to exert an influence on the growth of hair, for in a few instances hypertrophy has been associated with early sexual development of hair. On the other hand, disappearance of the pubic hair and non-development of

the genital organs have occurred in connection with defective suprarenals. Some forms of cortical overgrowth cause early adolescence and sexual precocity. A case is cited where, apparently from fright, a normal woman of twenty ceased to menstruate. A beard appeared, and she assumed a masculine aspect. Four years later a tumour of the right adrenal was removed, but so far the hirsuties has not lessened.

ECZEMA OF THE NAILS.

In course of a comprehensive article on the nails by Dr. Cunningham of New York (*New York Med. Journ.*, 3rd April 1915) he remarks that "in the treatment of eczema affecting the nails—usually some form of ointment or lotion is employed—none of the applications meet the indication of protection against violence, unless some cumbersome dressing is added. A readier, cleaner, and neater way of rising to the emergency is by the use of a salicylated plaster in strengths suited to the condition of the diseased tissue. Here we have medicament and protection. It can be cut in strips and stretched across the diseased areas, thereby bringing the medicament in constant touch with its object, and guarding against most of the petty traumatism that is such a marked feature in prolonging the mischief. It can be changed, as indicated, every day, every other day, or twice a week. If the salicylic acid is contra-indicated, zinc oxide can be substituted, or any of the drugs ordinarily employed can be incorporated in the plaster. Candidly, it is my opinion that the mechanical protection is of more importance than the medicinal agent, if the latter is not irritating. If irritating, it assumes an importance of an objectionable kind, and should be immediately dispensed with."

EPIDEMIC ALOPECIA IN SMALL AREAS.

Bowen (*Journ. Cut. Dis.*, May 1915) discusses this question. Among girls in various charitable institutions there have been recorded at intervals epidemics of local baldness, affecting a large proportion of the inmates at once. In most instances the bald areas were small, and more irregular and angular than we commonly see in alopecia areata. In many cases the whole scalp was studded with these small, irregular, and angular areas. But though this description applies to the epidemic as a whole, there were also cases in which larger patches, precisely like those of ordinary alopecia areata, were present in addition. Repeated histological and bacteriological examination of the hairs proved negative, as were all attempts at cultures. Various methods of treatment were tried, without conclusive results. At the end of two months the areas began to fill in, and at the termination of six months only a very few of the girls showed any sign of the trouble. An inquiry instituted many years after elicited that there had been no recurrence of the epidemic. In one instance the hair was thicker and longer than is

usual. In one epidemic described by Dreuw a permanent atrophy was noticed in 10 per cent., and these he classes with the alopecia atrophicans of Brocq.

LEAD POISONING AND NEURITIS FROM COSMETICS.

Smith, St. Louis (*Journ. Amer. Med. Assoc.*, 8th May 1915), observes that it has been long known that lead salts in face powder could cause poisoning. Though this appears to be recognised, the relative infrequency with which it is diagnosed leads one to assume that it must be often overlooked. Cases occur where there is gastro-intestinal disturbance of obscure origin, which subside without any treatment whatever; likewise jaundice, with crampy abdominal pain, where the "gall-stone attack" ceased in an unaccountably short time and no gall-stones were passed. Is it not possible, therefore, that this condition is not so rare as it may seem, but owes its infrequency to failure in diagnosis? He records two cases where flake white (lead carbonate) had been used for ten years, in which a "blue line" was found on the gums, with atrophy and cramp of muscles combined with distinct evidence of lead poisoning, and which recovered from those symptoms when the cosmetic was abandoned. Robinson of Kansas (*ibid.*, 6th March 1915) relates two similar instances. One was in a seamstress, aged 22, who presented symptoms of lead intoxication, with a combination of scapulo-humeral and wrist-drop type of neuritis. She had for years applied flake white to the face with a wet sponge. The other was a widow of 24, who had generalised pain, paralysis, and muscular atrophy. She had employed flake white as a cosmetic from her childhood. Recovery in both cases occurred when the lead was discontinued and remedies used to facilitate its extrusion from the body.

W. A. J.

NEW BOOKS.

Diabetes Mellitus. By NELLIS B FOSTER, M.D. Pp. 243.

Philadelphia and London: J. B. Lippincott Co. 1915.

UPON none of the problems of medicine has more energy in research been displayed than in the attempt to discover the underlying causes of diabetes mellitus; and in consequence a very large and complicated literature has accumulated upon this subject. Much of the experimental work performed has been contradictory, and indeed requires a special training in physiological chemistry for its interpretation; as a result, the study of the disease is one in which the practitioner is liable to find himself left far behind.

The book at present offered to the profession by Dr. Foster goes a long way to simplify this study, by bringing the most important experimental and chemical researches within the scope of a single

volume, together with a résumé of those facts of physiology which are necessary for their proper understanding and appreciation. These, together with the essential features of the disease, its complications, and treatment, are ably discussed, and give one a good idea of the magnitude and complexity of the subject. The value of the book is much enhanced by the references to important original papers which appear as footnotes.

Collected Papers of the Mayo Clinic, 1914. Vol. VI. Edited by Mrs. M. H. MELLISH. Pp. ix. + 814. With 349 Illustrations. Philadelphia and London: W. B. Saunders Co. 1915.

THE papers contained in this annual collection have for the most part already appeared in the current literature of the year, and are familiar to the majority of our surgical readers. Their value as contributions to the progress of surgery, however, are such that we welcome them in this form, which renders them easy of reference and once more emphasises the high standard of the work done in the Rochester clinic. The present collection bears favourable comparison with its predecessors, which is perhaps the highest praise we can offer it.

BOOKS RECEIVED.

- BAYLISS, W. M. Principles of General Physiology (Longmans, Green & Co.) 21s.
 BERKELEY, C., and V. BONNEY. A Guide to Gynæcology in General Practice
 (Frowde, and Hodder & Stoughton) 25s.
 DEJERINE, J., and E. GAUCKLER. The Psychoneuroses and their Treatment by Psycho-
 therapy. Second Edition (J. B. Lippincott Co.) 18s.
 DUCKWORTH, SIR DYCE. Views on some Social Subjects . . . (Geo. Allen & Unwin, Ltd.) 7s. 6d.
 DUPUY, G. M. The Stretcher-Bearer (Frowde, and Hodder & Stoughton) 2s.
 GROVES, E. W. HEY. Gunshot Injuries of Bones . . . (Frowde, and Hodder & Stoughton) 3s. 6d.
 HARRIS, W. Nerve Injuries and Shock (Frowde, and Hodder & Stoughton) 3s. 6d.
 HORDER, T. J. Cerebro-Spinal Fever (Frowde, and Hodder & Stoughton) 3s. 6d.
 HORSLEY, V., and M. D. STURGE. Alcohol and the Human Body. Fifth Edition.
 (Macmillan & Co., Ltd.) 1s.
 JONES, R. Injuries of Joints (Frowde, and Hodder & Stoughton) 3s. 6d.
 MACDONALD, D. M. Practical Prescribing and Treatment in the Diseases of Infants and
 Children (Frowde, and Hodder & Stoughton) 5s.
 MORISON, B. G. Life: A Poem (Baillière, Tindall & Cox) 3s. 6d.
 MORISON, R., and W. G. RICHARDSON. Abdominal Injuries
 (Frowde, and Hodder & Stoughton) 2s. 6d.
 MURPHY, J. K. Wounds of the Thorax in War . . . (Frowde, and Hodder & Stoughton) 2s. 6d.
 PATERSON, A. M. Manual of Embryology (Frowde, and Hodder & Stoughton) 10s. 6d.
 PLIMMER, R. H. A. Practical Organic and Bio-Chemistry . . . (Longmans, Green & Co.) 12s. 6d.
 PLOTZ, H., P. K. OLITSKY, and G. BAHR. The Etiology of Typhus Exanthematicus
 (Reprinted from the Journal of Infectious Diseases) —
 POWER, D'ARCY. Wounds in War: Their Treatment and Results
 (Frowde, and Hodder & Stoughton) 2s. 6d.
 PRACTITIONER'S Encyclopædia of Medical Treatment. Edited by W. L. Brown and J. Keogh
 Murphy (Frowde, and Hodder & Stoughton) 35s.
 RAWLING, L. B. Surgery of the Head (Frowde, and Hodder & Stoughton) 3s. 6d.
 SQUIRE, J. E. Medical Hints for the Use of Medical Officers Temporarily Employed with
 the Troops (Frowde, and Hodder & Stoughton) 2s. 6d.
 STILL, G. F. Common Disorders and Diseases of Childhood. Third Edition
 (Frowde, and Hodder & Stoughton) 16s.
 STODART, W. H. B. The New Psychiatry (Baillière, Tindall & Cox) 3s. 6d.
 THOMSON, ALEXIS, and ALEX. MILES. Manual of Surgery. Fifth Edition. Vol. I., General
 Surgery; Vol. II., Regional Surgery . . . (Frowde, and Hodder & Stoughton) 10s. 6d. each.

EDINBURGH MEDICAL JOURNAL

EDITORIAL NOTES.

CASUALTIES.

DIED of wounds received at the Dardanelles, Captain ALEXANDER GRAHAM, R.A.M.C.

Captain Graham was educated at Glasgow University, where he took the degree of B.Sc. in Pure Science in 1905.

LOST in the Transport *Marquette*, torpedoed and sunk in the Ægean Sea on 23rd October, Lieutenant FERGUS HAY YOUNG, R.A.M.C.

Lieutenant Young was educated at Glasgow University, where he took the M.A. in 1907, and M.B., B.Ch. in 1911.

THE names of the following students of medicine appear in recent casualty lists:—

SECOND-LIEUTENANT JAMES LEY PATON, 1st Batt. Black Watch, killed in France on 13th October, aged 22.

Lieutenant Paton was a final year medical student of St. Andrews University.

SECOND-LIEUTENANT D. FARQUHAR-THOMSON, 10th Batt. Gordon Highlanders, killed in France, aged 26.

Lieutenant Farquhar-Thomson was a medical student at the University of Edinburgh, where he was a member of the O.T.C.

CAPTAIN ROBERT A. WILSON, Royal Field Artillery, killed in France, aged 32.

Captain Wilson was a student of medicine at the Edinburgh University.

WAR HONOURS.

AMONG the officers decorated by President Poincaré during the King's visit to France was Surgeon-General Sir A. T. SLOGGETT, K.C.B., K.C.M.B., Director-General of the Medical Department of the British Army, who received the decoration of Commander of the Legion of Honour.

The following honours have been conferred on members of the medical services :—

The Distinguished Service Order—

Captain BERTRAM SIBBALD FINN, New Zealand Medical Corps, for conspicuous devotion to duty in the Gallipoli peninsula during operations from 6th to 9th August 1915.

Major GEOFFREY WALLACE GRAINGER HUGHES, 6th Cavalry Field Ambulance, R.A.M.C., for conspicuous ability and good work in arranging for the care and evacuation of the wounded at Loos on 26th-27th September 1915.

Captain WHITEFORD JOHN EDWARD BELL, M.B., No. 2 Field Ambulance, R.A.M.C., for conspicuous gallantry and devotion to duty on all occasions, notably near Loos, between 28th September and 1st October 1915.

Captain (Temporary Major) JOHN WILFRED BIRD, 6th London Field Ambulance, R.A.M.C. (T.F.), for conspicuous devotion to duty during operations at Maroc and Loos between 25th and 30th September 1915, in dealing with casualties.

Temporary Captain CHARLES STEWART PARNELL HAMILTON, R.A.M.C., attached 2nd Batt. the Buffs (East Kent Regiment), for conspicuous gallantry and devotion to duty from 27th-30th September 1915 in France.

Captain FRANK ROBSON KERR, M.B., R.A.M.C. (S.R.), for conspicuous gallantry and splendid devotion to duty at Cuinchy on 25th September 1915.

Captain ARTHUR JOHN ALEXANDER MENZIES, M.B., R.A.M.C., attached 1st (Royal) Dragoons, for conspicuous gallantry and devotion to duty from 26th-29th September 1915 in Loos.

The Military Cross—

Temporary Lieutenant ALLAN NOEL MINNS, 39th Field Ambulance, R.A.M.C., for conspicuous gallantry and devotion to duty at Suvla Bay, Gallipoli peninsula, on 30th August 1915.

Temporary Lieutenant HARRY BERTRAM WALKER, M.B., R.A.M.C., attached 9th Batt. York and Lancaster Regiment, for conspicuous gallantry and devotion to duty near Armentières on 25th September 1915.

Captain FRANK PERCY FREEMAN, R.A.M.C. (S.R.), attached 23rd Field Ambulance, for conspicuous gallantry and devotion to duty during operations near Hulluch from 25th-28th September 1915.

Captain JAMES RONALD MCURDIE, M.B., R.A.M.C. (S.R.) attached No. 2 Field Ambulance, for conspicuous gallantry and devotion to duty from 25th to 27th September 1915 at Le Rutoire farm, where, although continuously exposed to shell fire, he collected and treated the wounded.

Temporary Captain JAMES MURRAY M'LAGGAN, M.B., R.A.M.C., attached 3rd Batt. the Royal Fusiliers (City of London Regiment), for conspicuous gallantry and devotion to duty during the operations between 27th and 30th September 1915.

Temporary Captain CHARLES JOSEPH O'REILLY, M.D., 21st Field Ambulance, R.A.M.C., for conspicuous gallantry and devotion to duty during operations near Hulluch from 25th to 28th September 1915.

Captain THOMAS WALKER, M.B., R.A.M.C. (S.R.), attached No. 2 Field Ambulance, for conspicuous gallantry and devotion to duty from 25th to 27th September 1915, when he worked continuously, collecting wounded from the area Lone Tree to Hulluch Road and beyond.

Temporary Lieutenant DAVID CARNEGIE ALEXANDER, M.B., R.A.M.C., attached 5th Batt. the Queen's Own Cameron Highlanders, for conspicuous gallantry and devotion to duty between 25th and 27th September 1915 near "Fosse 8."

Temporary Lieutenant JOHN BRUCE BAIRD, No. 1 Field Ambulance, R.A.M.C., for conspicuous gallantry and devotion to duty from 25th to 27th September 1915 between Lone Tree and Hulluch Road.

Temporary Lieutenant GEORGE RANKINE, M.B., R.A.M.C., attached Headquarters 9th Divisional Royal Engineers, for conspicuous gallantry and devotion to duty from 26th to 28th September 1915 at Saily and Vermeilles when attending to and evacuating the wounded.

Temporary Lieutenant BERNARD SCORE BROWNE, M.B., R.A.M.C., attached 2nd Batt. the Cheshire Regiment, for conspicuous gallantry and devotion to duty near Vermeilles, 2nd-3rd October 1915.

Second-Lieutenant C. S. PEDDIE BLACK, 6th Batt. Highland Light Infantry, for gallantry in the Dardanelles on 29th October 1915.

THE EDINBURGH MEDICAL JOURNAL, LIMITED.—The annual general meeting of the Edinburgh Medical Journal, Limited, was held on the 17th November, when the directors were able to submit a satisfactory report for the year ending 31st December 1914. After declaring a dividend at the same rate as has been paid for the last few years, a substantial balance was carried forward. Dr. A. H. F. Barbour was re-elected to the directorate.

CLINICAL STUDIES. VII.—ANGINA PECTORIS.

By BYROM BRAMWELL, M.D., F.R.C.P.E., LL.D., F.R.S.E., Consulting Physician, Royal Infirmary, Edinburgh; Physician, Chalmers Hospital, Edinburgh.

THE exact mode of causation of angina pectoris is still one of the most disputed points in cardiac pathology. In my book on the *Heart*, published in the year 1884 (p. 672), I stated: "The group of symptoms included under the term 'angina pectoris' may in all probability be produced by a number of different causes; it is very difficult to give a satisfactory systematic account of the etiology and pathology of the condition, and it is, I believe, impossible to advance any single theory which will satisfactorily account for the phenomena in all cases. . . ." I described and figured diagrammatically (see p. 31) the composition and distribution of the nerves passing to and from and on the surface of the aorta. I stated that cardiac pain may theoretically result from excessive stimulation or disease of the sensory (I should now say afferent) nerve apparatus connected with the heart in any part of its course. I suggested that in those cases of angina pectoris in which the coronary arteries are diseased, the coronary nerves (which are so closely connected, in their course over the exterior of the heart, with the branches of the coronary arteries) are probably implicated. I stated that in a considerable proportion of the cases of angina pectoris the aorta is dilated or aneurysmal, and referred to the observations of Lancereaux, Peter, and Bazy, who in three cases found definite pathological changes in the branches of the cardiac plexus passing over the root of the aorta. I then discussed in great detail the exact manner in which the pain is produced in cases of angina pectoris.

In the *British Medical Journal*, 15th January 1910 (p. 126), I returned to the subject and reiterated my views, published in 1884, to which I still adhere. I emphasised the point that any theory of the causation of angina pectoris, if it is to be satisfactory, must explain the facts—(1) *That in the great majority of cases of angina pectoris the pain radiates down the left arm*; (2) *that in some cases it radiates down both arms*; and (3) *that in exceptional cases, which are rare, it is referred to the right arm only*. I stated: "Now, taking all these facts in connection, we may, I think, with some probability theorise that in many cases of angina pectoris the sequence of events is as follows:—

"*Firstly*, a sudden strain is thrown upon the left ventricle, either as the result of muscular effort or an increase of the peripheral resistance due to contraction of the peripheral arteries, the result of some external condition (sudden effort, exposure to cold, mental agitation, etc.), some reflex impulse arising within the body, or changes arising in the central nervous system (vasomotor centre). The strain or increased blood-pressure may be actual or merely relative in proportion to the weakened left ventricle. In some cases in which the cardiac muscle or cardiac nerves are diseased, the attack arises independently of any muscular effort or sudden increase of the peripheral resistance.

"*Secondly*, in consequence of the strain (either actual or relative) which is thrown on the cavity of the left ventricle, or those fibres of the left ventricle which are degenerated, either as the result of imperfect blood-supply (disease of the coronary arteries), or of degenerative changes in the cardiac muscle, irritation of the afferent (? sensory) cardiac nerves is produced. This irritation is attended with severe pain (angina pectoris).

"The exact cause of the irritation of the afferent (? sensory) cardiac nerves is not clear, *and this seems to me to be the point with regard to the pathology of angina pectoris which needs to be cleared up*; perhaps it is spasmodic contraction of some of the muscular fibres, perhaps increased tension in the cavity of the ventricle.

"*Thirdly*, this irritation of the terminal branches of the afferent (? sensory) nerves in the wall of the left ventricle (including under this term the pericardium, myocardium, and endocardium), is reflected, *via* the sympathetic branches of the cardiac plexus, distributed to the left ventricle, through the spinal cord (left side of the upper dorsal segments) to the periphery.

"Now we would naturally expect that the reflex impression would be first reflected and referred to those parts of the periphery which are the more immediately connected with the spinal centres to which the cardiac branches of the sympathetic distributed in the wall of the left ventricle pass; and that when the irritation was extreme, the stimulus might extend to other and more distant masses of spinal grey matter, and be reflected to other and more distant parts of the periphery. And such is in fact the case. In most cases of organic angina pectoris the pain radiates up to the left shoulder and down the left arm, sometimes to the tips of the fingers; in exceptional cases it may pass down the right arm, to one or both sides of the neck, or even to one or both legs.

"The radiation to the left shoulder and left arm is so con-

stantly observed in typical cases of angina pectoris that it has been by some writers supposed that the primary lesion is situated in the spinal cord itself; but with this opinion I cannot agree. . . .

"This explanation of the mode of causation of the pain in angina pectoris is in accord with, and is corroborated by, the facts (1) that the exciting causes of angina pectoris are increased muscular effort and conditions which produce increased pressure in the peripheral arterial circulation—that is, conditions which throw an increased strain (either actual or relative) on the left ventricle; (2) that in many cases of angina pectoris the paroxysm is at once relieved by rest (stopping to rest while going uphill, etc.) and remedies (nitrite of amyl, etc.) which rapidly reduce arterial tension and take off the strain from the left ventricle; and (3) that in some cases of angina pectoris the attacks of angina disappear with the development of mitral regurgitation.

"But further, and this is a point which for many years I have emphasised in my teaching, in the exceptional cases of angina pectoris in which the pain radiates to both arms or to the right arm alone, the 'coarse' lesions, which are associated with and which are apparently the cause of the pain, often (? always) involve the root of the aorta or the aortic arch. I have met with a number of clinical cases which seem to support this view, viz. that in the exceptional cases in which the pain radiates down the right arm, the pain is due to irritation of the afferent (? sensory) nerves which ramify over the base or arch of the aorta."

I then referred to Sir T. Clifford Allbutt's view, that "the origin of angina pectoris was not in the heart but in the supra-sigmoid portion of the aorta and its investments," a view which he has still further elaborated in his recent most erudite and exhaustive work on *Diseases of the Arteries, including Angina Pectoris*, and stated: "In the article on angina pectoris in my *Diseases of the Heart* (published in 1884), I stated that disease at the root of the aorta and of the nerves ramifying over the root of the aorta seems in some cases of angina pectoris to be the cause of the pain. But that disease at the root of the aorta, or stretching of the root of the aorta, is the usual cause of angina pectoris, as Sir T. Clifford Allbutt supposes, seems to me to be contradicted by the fact that in the great majority of typical cases of angina pectoris the pain is reflected to the left shoulder and left arm. It is difficult, I think, to conceive that irritation arising in the aorta above the sigmoid valves in the way Sir T. Clifford Allbutt supposes could be so constantly reflected to one (the left) side of the body; while the

fact that in many of the exceptional cases of angina pectoris in which the pain is reflected to both arms or to the right arm only, my clinical and pathological observations show that the root or arch of the aorta is diseased is, I think, of great significance. It is easy to conceive that when disease at the root of the aorta is the cause of angina pectoris the pain would be reflected to both arms, since in these cases the afferent nerves from *both* ventricles or from the aorta itself (passing to both sides of the spinal cord) would be likely to be implicated; and that in some cases of aneurysm of the aortic arch or local disease of the aortic arch, the nerves passing from the right side of the heart or the right side of the aorta to the right side of the spinal cord might alone be implicated; this would explain the reflection of the pain to the right arm alone."

I then considered other theories, which I had already suggested in my book on the *Heart*, to account for the radiation of the pain to the right arm, and the intermittent claudication view of the mode of production of the pain.

To sum up, my view of the mode of production of the pain in angina pectoris is:—

1. That in the ordinary typical cases in which the pain radiates down the left arm, the afferent nerves of the heart distributed to or over the left ventricle are irritated; that the exact manner in which this irritation is excited (whether localised spasm, increased tension in the cavity of the ventricle, etc.) is still undecided; that the exciting cause of the pain in this and indeed in all types of angina pectoris is usually increased blood-pressure, whether actual or relative (walking uphill, against a wind, etc.); that over-distension of the stomach (walking after a full meal, flatulent distension, etc.) is a frequent exciting cause of the attacks; that in some cases emotional excitement is the exciting cause; that in other cases there is no apparent exciting cause.

2. That in the exceptional cases in which the pain is reflected to the right arm alone, the afferent nerves distributed to the aorta or passing over the aorta from the right side of the heart are irritated; that perhaps in some of these cases (though this seems to be less likely), the afferent nerves distributed to and over the right ventricle are directly irritated in the same way that the nerves distributed to or over the left ventricle are irritated in the ordinary cases included in group 1. This seems to be supported by my clinical experience, which shows that in the cases included in this group (2) and in the next group (3), lesions of the aorta

are much more frequently present than in the cases included in group 1.

3. That in some of the cases in which the pain is referred to both arms, the irritation first passes to the left side and then over to the right side of the spinal cord, and so first to the left and then to the right arm; in other cases the irritation first passes to the right side and then to the left side of the spinal cord, and so first to the right arm and then to the left arm.

With the object of trying to clear up these difficult and debatable questions I have carefully gone over the notes of 178 cases of angina pectoris which have come under my notice. (These 178

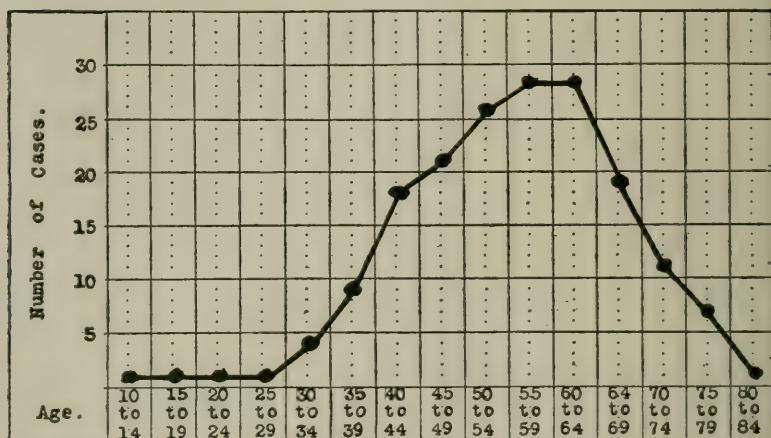


FIG. 1.—Chart showing the Age-Frequency, in Periods of Five Years, in 178 Cases of Angina Pectoris.

cases include only those cases in which the patients consulted me because of the angina, and do not include a very large number of other cases in which anginous pain (in many cases typical angina pectoris) occurred incidentally as it were in the course of cases of cardiac or aortic disease.)

ANALYSIS OF 178 CASES OF ANGINA PECTORIS.

Of the 178 cases, 136, or 76·4 per cent., were males, and 42, or 23·5 per cent., were females; 54, or 30·3 per cent., were hospital patients, and 124, or 69·6 per cent., were private patients.

Age.—The ages in the 178 cases are shown in Table I. and graphically represented in periods of five years in Fig. 1. My

experience shows that angina pectoris is very rare before the age of 30; that from the age of 30 the cases gradually increase in number until the maximum is reached between the ages of 55 and 64; that after the age of 64 there is a rapid decline until the age of 81. The youngest patient in my series was aged 13 and the oldest 81. I append brief clinical details of these two very exceptional cases.

TABLE I.—SHOWING THE AGES IN 178 CASES OF
ANGINA PECTORIS.

Age.	No. of Cases.	Age.	No. of Cases.	Age.	No. of Cases.
13	1	47	3	65	5
15	1	48	5	66	3
23	1	49	5	67	5
26	1	50	3	68	4
31	2	51	4	69	2
34	2	52	8	70	4
35	2	53	5	71	3
36	2	54	6	72	3
37	3	55	4	73	1
38	1	56	7	75	4
39	1	57	5	77	1
40	5	58	7	78	2
41	3	59	5	81	1
42	3	60	7	Not stated	2
43	3	61	5		178
44	4	62	5		
45	3	63	8		
46	5	64	3		

Typical and Severe Angina Pectoris in a Boy aged 13; Aortic Stenosis, Mitral Regurgitation, and (?) Adherent Pericardium.—J. M., aged 13, admitted to Edinburgh Royal Infirmary on 5th November 1904.

Complaints.—Recurring attacks of severe pain in the chest, radiating to the back, to both arms and both legs.

Duration.—One year.

History.—Has been short of breath on exertion as long as he can remember. Has had bronchitis every winter since he was 7 months old; measles at 4; whooping-cough at 5 years of age; never rheumatism, scarlet fever, or chorea.

The attacks of pain used to come on only as the result of exertion and excitement; latterly they have occurred even while he was at rest in bed without any apparent cause; they occur twice or thrice a day and sometimes waken him up at night.

The pain is very severe. It commences in the præcordial region, passes through to the back, over the right side of the chest and right side of the abdomen, down the arms, especially the outer side of the left, as far as the wrist, also down both legs; it seems to take the power out of his legs.

The attacks of pain usually last about three minutes.

The patient is short of breath on exertion.

Radial pulse, 78; regular, small, low tension. Apex-beat in the 5th interspace in the line of the nipple; pulsation in the 4th interspace and the epigastrium.

Heart enlarged towards the right; dulness extends three-quarters of an inch to the right of sternum. Soft systolic murmur in the mitral area; loud systolic murmur projected into the arteries of the neck in the aortic area. Apex-beat seems fixed, and there is some systolic retraction.

Slight bronchitis and some emphysema.

Diagnosis.—Aortic stenosis; slight mitral regurgitation; adherent pericardium; some bronchitis; slight emphysema; dilatation of right heart.

Result.—The patient remained in hospital until 24th November, when he was discharged very much improved.

Treatment.—This consisted in rest in bed, allaying the bronchitis, and the administration of arsenic and strychnine.

Angina Pectoris occurring at the Age of 81.—Male (gentleman), aged 81; seen 11th September 1906.

Duration.—Has suffered for many years from pain in the region of the heart going through to the back; during the past three or four years he has had several typical and very severe paroxysms of angina pectoris, the pain going down the left arm and up the left side of the neck.

Pain.—The pain is very severe, and causes him to break into a profuse sweat.

Cause.—The attacks used only to come on when walking quickly, up a hill or against a wind, especially after meals; now, walking forty or fifty yards on the flat is apt to bring on an attack, and he has had several severe attacks through the night.

The digestion is good; the appetite is good; his bowels are regular with medicine; he has had little trouble with flatulence.

A systolic musical murmur is audible in all the cardiac areas, most marked at the mid-sternum, at the 2nd right costal cartilage, and propagated up into the arteries of the neck. The pulse is irregular—frequency from 48 to 65 beats per minute; the arterial wall is thickened and atheromatous.

Distribution of the Pain.—In 26 cases, or 14·6 per cent., the

pain was limited to the chest and precordial region; in 87 cases, or 48·8 per cent., it extended down the left arm alone; in 18 cases, or 10·1 per cent., down the right arm alone; and in 47 cases, or 26·1 per cent., down both arms.

In 18 of the 178 cases, or 10·1 per cent., the pain radiated to one or both sides of the neck; and in 12 cases, or 6·7 per cent., it radiated to one or both legs.

From this statement it will be seen that in 152 cases in which the pain was referred to the arms, in 87, or 57·2 per cent., it affected the left arm only; in 18 cases, or 11·8 per cent., it affected the right arm only; and in 47 cases, or 30·9 per cent., it affected both arms.

Cardiac and Aortic Lesions Present.—In 48, or 26·9 per cent., of the 178 cases no definite lesion was detected either in the heart or aorta; in 28 cases, or 15·7 per cent., the heart's action was weak and the muscular wall of the heart apparently degenerated (fatty, fibroid, etc.); in 12 cases, or 6·7 per cent., the heart was enlarged without obvious valvular lesion; in 44 cases, or 24·7 per cent., a valvular lesion was present; in 1 case, or 0·5 per cent., the pericardium was adherent, and in 45 cases, or 25·2 per cent., the aorta was either dilated or aneurysmal.

The fact that in 48, or 26·9 per cent., of the 178 cases no lesion was detected either in the heart or aorta seems, at first sight, remarkable; but it must be remembered that the lesion with which angina pectoris is most frequently associated, viz. disease of the coronary arteries, cannot be detected during life, and, further, that a dilated condition of the aorta and aneurysms of the aorta, more especially if the lungs are voluminous or emphysematous, and if the aneurysm is small and deep-seated, may also defy detection except by X-ray examination. In several recent cases an X-ray examination has disclosed the presence of an aortic aneurysm which could not be detected in any other way. In many of the 48 cases in which no lesion of the heart or aorta could be detected, the aortic second sound was accentuated; in some of these cases aortic disease was probably present.

The more exact details of the various lesions present in the 178 cases, and in the groups of cases in which the pain radiated (*a*) to the left arm, (*b*) to the right arm, (*c*) to both arms, and (*d*) in which there was no pain in the arms, are shown in the following table:—

TABLE II.—SHOWING THE NATURE OF THE CARDIAC OR AORTIC LESION IN 178 CASES OF ANGINA PECTORIS.

Lesion.	Left Arm.	Right Arm.	Both Arms.	No Pain in Arm.	Total.
No lesion detected	21	5	15	7	48
Weak action; muscular degeneration .	16	2	...	10	28
Enlarged; no valvular lesion	8	...	3	1	12
Aortic regurgitation	9	...	3	1	13
" " and dilated aorta	2	...	4	...	6
" " and aneurysm . . . . .	...	...	1	...	1
" " and (?) aneurysm	1	...	...	...	1
Aortic stenosis	3	...	...	...	3
Mitral regurgitation	10	1	1	4	16
" " and dilated aorta . . . .	...	...	1	...	1
" " and (?) aneurysm . . . . .	...	...	1	...	1
Mitral stenosis	1	...	...	...	1
" " and regurgitation	1	...	1	...	2
Aortic and mitral disease	6	...	2	1	9
Dilated aorta	3	3	3	...	9
(?) Dilated aorta	2	...	3	...	5
Dilated aorta and aneurysm . . . . .	...	...	1	...	1
" " and (?) aneurysm	2	1	4	...	7
Aneurysm . . . . .	...	6	2	1	9
(?) Aneurysm	1	...	2	...	3
Pericarditis and (?) aneurysm	1	...	...	...	1
Adherent pericardium . . . . .	...	...	...	1	1
	87	18	47	26	178

An analysis of the lesions in the different groups of cases is shown in Table III.

TABLE III.—ANALYSIS OF THE LESIONS DETECTED IN 178 CASES OF ANGINA PECTORIS.

Lesion.	Left Arm.	Right Arm.	Both Arms.	No Pain in Arms.	Total.
No lesion detected	87 Cases.	18 Cases.	47 Cases.	26 Cases.	178.
Weak action; muscular degeneration	45, or 51·7%	7, or 38·8%	18, or 38·2%	18, or 69·2%	88, or 49·4%
Enlarged; no valvular lesion	30, or 34·4%	1, or 5·5%	7, or 14·9%	6, or 23%	44, or 24·7%
Valvular lesion	...	...	...	1, or 3·8%	1, or 0·6%
Adherent pericardium	12, or 13·7%	10, or 55·5%	22, or 46·8%	1, or 3·8%	45, or 25·3%
Aortic dilatation and aneurysm	87, or 48·8% of total cases.	18, or 10·1% of total cases.	47, or 26·1% of total cases.	26, or 14·4% of total cases.	178 cases.

It will be seen that in the cases in which there was no pain in the arms, aortic dilatation or aneurysm was detected in 1 case, or 3·8 per cent.; in the cases in which the pain radiated down the left arm alone, in 12 cases, or 13·7 per cent.; in the cases in which the pain radiated down the right arm alone, in 10 cases, or 55·5 per cent.; and in the cases in which the pain radiated to both arms, in 22 cases, or 46·8 per cent.

This analysis seems therefore to fully confirm the view that I have for many years advocated, viz. that in the cases of angina pectoris in which the pain radiates to the right arm alone, or to both arms, the aorta is much more frequently diseased than in the cases in which the pain is confined to the chest or in which it radiates to the left arm alone.

I do not, of course, mean to suggest that in those cases in which an aneurysm is present that the aneurysm itself is the direct cause of the pain. The aneurysm in these cases is merely a manifestation of a diseased aorta; it is usually the result of syphilitic disease of the artery; in cases of aneurysm, other parts of the artery are usually affected; consequently, whatever the position of the aneurysm, the nerves ramifying over the base and arch of the aorta are frequently involved and (?) irritated.

In many cases of aneurysm in which a fixed pain is present in the chest, radiating or lancinating pains are occasionally felt in the right arm. I have notes of a number of cases of this description. I have not included cases of this kind in my cases of angina pectoris; I have only included those cases of aneurysm in which paroxysms of typical angina pectoris occurred and in which the patient was free from pain between the paroxysms.

I append the clinical details of a number of illustrative cases.

CASES OF ANGINA PECTORIS IN WHICH THE PAIN RADIATED DOWN THE RIGHT ARM ONLY.

CASE I.—*Severe Angina Pectoris; Pain in Right Arm only; Mitral Regurgitation.*—Female, aged 37; married; seen September 1886.

Duration.—Three years.

Apparent Cause.—Attack of acute rheumatism.

Pain.—The pain is very severe and often associated with a feeling of impending death; it commences in the præcordial region, goes through to the back and down the right arm on the inner side to the tips of the fingers.

The patient is a fat, pale woman; she is very short of breath on

exertion. Going up stairs or up a hill and agitation bring on the pain.

A systolic murmur is audible at the apex; the right ventricle is enlarged; the aortic second sound accentuated; the urine normal.

CASE II.—*Severe Angina Pectoris; Pain down the Right Arm; Atheromatous Arteries; Dilated Aorta.*—Male, aged 45; seen September 1887.

Thirty years ago rheumatic fever. Short of breath for ten or twelve years.

Pain.—Pain very severe; commences over the middle of the sternum and passes down the right arm to the tip of the middle finger, and also up the right side of the neck.

The patient has a feeling of impending death during the attacks.

Any exertion, such as straining at stool, brings on the attacks; exposure to cold also apt to bring on an attack.

Systolic murmur audible over the mid-sternum and in the aortic area; aortic second sound accentuated; arteries atheromatous.

CASE III.—*Angina Pectoris; Pain down the Right Arm; no apparent Cardiac or Aortic Disease.*—Male, aged 71; married; seen 26th April 1894.

The pain commences between the shoulders and shoots down the right arm.

Exertion causes shortness of breath, a feeling of oppression about the chest, and brings on the attacks of pain. The appetite is good; there is some indigestion.

The heart appears to be normal; the superficial arteries are not atheromatous; there is no definite evidence of aortic disease or aneurysm.

CASE IV.—*Angina Pectoris; Pain down the Right Arm; Previous Syphilis; Weak Action of Heart (? Fibroid Degeneration); No Aortic Disease.*—Male, aged 64; seen 28th February 1895.

Many years ago had a gummatous lesion of the cauda equina; recovered completely.

Pain.—The pain is felt at the lower part of the sternum, and shoots down the right arm to the wrist.

Exertion, especially going up a hill, brings on the pain and compels the patient to stop; there is no dyspepsia or flatulence.

The pulse is weak; the heart's action and sounds are weak and at times irregular; (?) fibroid degeneration.

CASE V.—*Severe Angina Pectoris; Pain down the Arm; Aortic Dilatation.*—Female, aged 40; married; seen 7th July 1897.

Duration.—One year.

Pain.—The pain is severe and occurs in paroxysms; it commences in the mid-sternal region and shoots down the right arm.

Exertion, especially going up a hill, brings on the pain. It occasionally occurs at rest, *i.e.* during the night.

The patient is short of breath on going up stairs or up a hill; the digestion is good.

There is increased dulness and a systolic murmur over the arch of the aorta.

CASE VI.—*Angina Pectoris; Pain down the Right Arm; Aortic Dilatation; (?) Aneurysm.*—Male, aged 63; seen on 5th March 1899.

The pain commences in the right chest, shoots through to the back, and goes down the right arm.

Duration.—Fourteen months.

Physical examination shows some impairment of the percussion-note and marked accentuation of the aortic second sound over the arch of the aorta.

CASE VII.—*Severe Angina Pectoris; Pain down the Right Arm; Heart's Action very Weak; (?) Muscular Degeneration.*—Male, aged 51; seen 25th April 1899.

Duration.—Two years.

Pain.—The pain is very severe; it begins in the præcordial region and shoots down the right arm to the tips of the fingers.

The patient is very short of breath on exertion. Walking fast or up a hill brings on the attacks; the digestion is good.

The heart's action and sounds are very feeble (*?* muscular degeneration).

CASE VIII.—*Severe Angina Pectoris; Pain down the Right Arm; No obvious Cardiac or Aortic Disease.*—Male, aged 68; seen 16th May 1899.

Duration.—Six weeks.

Pain.—The pain is very severe; it is felt at the bottom of the sternum, across the chest and down the right arm; it is often associated with a choking feeling.

The patient is short of breath on exertion.

Exertion brings on the attacks; walking, even on the flat, is apt to induce pain.

The pulse is small and weak; heart sounds faint (*?* muscular degeneration); urine normal.

CASE IX.—*Severe Angina Pectoris; Pain down the Right Arm; No Signs of Cardiac or Aortic Disease.*—Male, aged 59; seen 27th July 1899.

Duration.—Three years.

Pain.—The attacks are typical; pain very acute; felt in the throat and down the right arm.

The patient is not short of breath.

No obvious cardiac or aortic disease detected.

CASE X.—*Severe Angina Pectoris ; Pain passing down the Right Arm ; Dilated and (?) Aneurysmal Aorta.*—Male, aged 66 ; grocer ; seen 13th November 1899.

Duration.—Twelve years.

Exertion—going up a hill, against a wind—agitation and excitement bring on the attacks.

Pain.—The pain is very severe and occurs in paroxysms ; it commences in the middle of the chest, passes through to the back and down the right arm, which feels very weak after the attacks. If free from pain is not short of breath.

Physical examination shows loudly accentuated aortic second sound and some dulness over the aortic arch and to the left of it.

CASE XI.—*Angina Pectoris ; Pain down the Right Arm ; Aneurysm of the Transverse Aortic Arch.*—Male, aged 34, labourer ; admitted to Edinburgh Royal Infirmary on 31st December 1900.

Complaints.—Shortness of breath, pain in chest, etc.

Duration.—Six months.

Pain.—This used to come on in paroxysms, appearing suddenly and disappearing suddenly ; it affected the upper part of the right chest and passed down the right arm.

On admission to hospital, the pain did not radiate in any direction ; it was a fixed dull pain in the right infraclavicular region.

Physical examination showed an aortic aneurysm pressing upon the trachea.

CASE XII.—*Severe Angina Pectoris ; Pain down the Right Arm ; Aortic Aneurysm.*—Male, aged 58 ; seen 13th March 1902.

Duration.—Seven years.

The pain comes on in paroxysms and is very severe ; it commences in the mid-sternal region, passes to the right shoulder-blade and right arm, and is followed by temporary weakness of the arm. It came on suddenly seven years ago, disappeared after a short time, and has returned frequently since.

Physical examination shows a large aneurysm involving the ascending and transverse parts of the aorta, pointing at the "seat of election"—second right interspace.

CASE XIII.—*Angina Pectoris ; Pain down the Right Arm ; High Blood-pressure ; No Evidence of Cardiac or Aortic Disease.*—Male, aged 71 ; seen 9th September 1902.

Pain.—The pain commences in the middle of the chest and goes down the right arm.

Exertion, especially after a meal, causes the attacks. The patient is flatulent; he thinks the stomach is the cause of the attacks. Wakes sometimes during the night gasping for breath.

Blood-pressure high; urine contains no albumin; no physical signs of cardiac or aortic disease.

CASE XIV.—*Severe Angina Pectoris; Pain down the Right Arm; Aortic Aneurysm.*—Male, aged 45, boiler-maker; admitted to Edinburgh Royal Infirmary on 28th February 1903.

Duration.—Two years.

Pain.—Occurs in paroxysms and is very severe; it commences in the mid-sternal region and extends to and down the right arm.

Pulsation over upper part of chest and marked dulness, especially towards the left; loudly accentuated aortic second sound; some huskiness of voice; slightly defective action of the left vocal cord. X-ray examination shows a large aneurysm.

CASE XV.—*Angina Pectoris; Pain down Right Arm; no Physical Signs of Cardiac or Aortic Disease.*—Female, aged 48, married; seen 25th June 1904.

Pain.—Severe; commences in the præcordial region and sometimes goes down the right arm.

No physical signs of disease in the heart or aorta.

CASE XVI.—*Severe Angina Pectoris; Pain down the Right Arm; Dilated and Aneurysmal Aorta.*—Female, aged 60, married; seen at the Edinburgh Royal Infirmary on 24th May 1905.

Pain.—Very severe; it commences in the middle of the right side of the chest, goes through to the back, up to the right shoulder and down the right arm.

Exertion brings on the attacks.

Some impairment of the percussion-note and a systolic murmur over the ascending aortic arch. X-ray examination shows well-marked dilatation of the aorta and an aneurysmal bulging, especially towards the left, over the upper part of the sternum.

CASE XVII.—*Aortic Aneurysm; Shooting Pains in the Chest and Right Arm.*—Male, aged 61; seen 20th September 1908.

The pain affects the right side of the chest, passes to the back, right shoulder, and down the right arm. Exertion increases the pain.

The aortic second sound is markedly accentuated; dulness over the manubrium sterni; the left pulse is larger than the right; the right arm is weak.

CASE XVIII.—*Severe Angina Pectoris; Pain down the Right Arm; Aortic Aneurysm.*—Male, aged 67, packman; admitted to Chalmers Hospital on 8th October 1913.

Duration.—Six years.

Pain.—Intense ; occurs in paroxysms—typical angina pectoris. The pain commences in the mid-sternal region, goes down the right arm, and is also sometimes felt in the finger-tips of the left hand.

Exertion—going up a hill, walking quickly, walking against a wind—brings on the pain ; latterly, it sometimes occurs spontaneously even when lying quiet in bed ; is more apt to come on after a meal.

X-ray examination shows a very marked aneurysmal dilatation of the transverse part of the aortic arch ; bulging, especially towards the left, in the first and second interspaces.

The blood-pressure is high—210 to 215 ; the urine is normal.

Discharged from hospital on 22nd October 1913, somewhat improved.

Patient's doctor wrote on 20th February 1914 :—"He died in an anginal attack suddenly a few weeks ago."

CASES OF ANGINA PECTORIS IN WHICH THE PAIN RADIATED DOWN BOTH ARMS.

The following are some of my cases of this kind in which the aorta was diseased.

CASE I.—*Severe Angina Pectoris ; Pain Radiating to Both Arms, Both Sides of the Neck, and Both Legs ; Dilated and Aneurysmal Aorta ; Aortic Regurgitation.*—Male, aged 44, linoleum maker ; admitted to the Edinburgh Royal Infirmary on 20th June 1902.

Paroxysmal attacks of severe anginous pain.

Duration.—Three years.

Pain.—Occurs in paroxysms, is very severe ; it is excited when he walks quickly, goes up stairs or against a wind ; it does not occur when he is lying quiet. If he rests for five minutes the pain disappears ; he feels "fair done up" after an attack.

The pain is very severe ; it commences about the centre of the sternum, passes up to the left shoulder, down both arms, sometimes up both sides of the neck, sometimes down both legs.

The patient is a very powerful, muscular man.

X-ray examination showed a very large aneurysm of the aortic arch bulging to the left ; there was slight aortic regurgitation.

The only pressure sign was slight difficulty in swallowing.

CASE II.—*Severe Angina Pectoris ; Aortic Aneurysm ; Pain down the Right Arm, sometimes down the Left.*—Male, aged 41, hawker ; admitted to Edinburgh Royal Infirmary on 8th November 1902.

Duration.—2½ years.

Pain.—Very severe ; chest feels as if gripped in a vice. The pain begins about the region of the apex-beat of the heart, passes up and across to the right collar-bone and base of the neck ; is then diffused

across the chest: then (sometimes) leaves the heart and chest and passes out to the right arm from the elbow to the wrist, occasionally to the finger-tips; the left arm is also sometimes affected.

During the attacks the patient sometimes has a terrible feeling of dread and impending death.

The pain usually is located to the region of the heart for five minutes before it passes into the arms; it will continue for hours unless relieved by nitrite of amyl.

Exertion, even walking on the flat now, induces the attacks; if the patient stops, the pain passes off; latterly the attacks have occurred even when lying in bed without any apparent cause. Excitement also induces attacks. No dyspepsia; no flatulence.

Some prominence over the upper part of the sternum, with dulness and accentuation of the heart sounds. X-ray examination shows aneurysmal dilatation of the transverse part of the aortic arch.

Patient remained in hospital from 8th November 1902 to 8th January 1903; during this time he had fifty-three attacks, sometimes as many as five in one day. The only thing which relieved the attacks was nitrite of amyl and liquor trinitrini in large doses. He also had iodide of potassium.

CASE III.—*Angina Pectoris; Aortic Aneurysm; Pain down Both Arms.*—Male, aged 50, gardener (formerly soldier); admitted to the Edinburgh Royal Infirmary on 11th November 1902.

Duration.—Three months.

Attacks very severe; the pain is felt in the mid-sternal region; it goes through to the back and down the right arm.

Marked signs of aortic aneurysm—dulness in course of the aortic arch, especially 2nd right interspace, loudly accentuated aortic second sound with slight diastolic murmur; pulses unequal with rounded apex; tracheal tugging; some difficulty in swallowing.

CASE IV.—*Angina Pectoris; Aortic Disease; Pain going down Both Arms—very Severe.*—Male, aged 53, cab-driver; admitted to Edinburgh Royal Infirmary on 13th October 1904.

Duration.—Ten months.

Pain.—Occurs in paroxysms and is very severe; it is attended with a constrictive feeling in the chest; it extends down both arms, especially the left.

Exertion, especially after a meal or when flatulent, brings on the attacks.

Marked dulness over the aorta, with double aortic murmur; X-ray examination shows a dilated aorta.

CASE V.—*Angina Pectoris; Pain down Both Arms; Dilated and (?)*

Aneurysmal Aorta.—Male, aged 47, general dealer; admitted to Edinburgh Royal Infirmary on 19th June 1907.

Duration.—Nine weeks.

Pain.—Very severe; it commences in the pit of the stomach and spreads slowly upwards; the patient feels as if he were stabbed in the chest; the pain goes down both arms, especially the right; a fearful pain is felt in each wrist. After the attacks both arms feel "fair paralysed."

Impairment of percussion-note in the 2nd and 3rd interspaces. X-ray examination shows dilatation of the aorta with distinct pulsation in the dilated swelling.

CASE VI.—*Angina Pectoris; Aortic Disease; Pain down Both Arms.*—Male, aged 67, iron-moulder; admitted to Edinburgh Royal Infirmary on 19th June 1907.

Duration.—Ten years.

Attacks very severe; the pain is felt in the middle of the chest, with a feeling of constriction; it passes down both arms, especially the left.

Physical examination shows dilatation of the aorta with slight regurgitation at aortic orifice.

A FRENCH COUNTRY PRACTITIONER OF THE
OLD SCHOOL.

By J. BARFIELD ADAMS, L.R.C.P., L.R.C.S.,
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SOME months ago a writer in a London Sunday newspaper suggested that *Madame Bovary* was the finest novel in the French language. Probably this is an opinion that very few readers would be inclined to endorse. Even among Flaubert's most ardent admirers there are some who would prefer the gorgeous *Salammbô* to the sordid *Madame Bovary*. It is impossible to compare the novel in question with any of Victor Hugo's masterpieces, the class of writing being so utterly different. Even in the realistic school itself there are at least two, if not three, of Zola's books which surpass *Madame Bovary* in the very qualities in which its author is supposed to excel. And coming to the later French writers, surely, as a work of art, Flaubert's novel cannot be compared with Pierre Loti's pathetic little idyll, *Pêcheur d'Islande*.

Mais chacun à son goût.

Flaubert's great fault is his laboured style. His industry is too evident. He draws every line with a hard pencil and with the full weight of his hand. In *Madame Bovary* he is also unfortunate in his heroine. From start to finish she fails to enlist the reader's interest. She is a commonplace woman who carries the hysterical fancies of a schoolgirl into adult life. She commits gross sins, as some people tell lies, without any reasonable motive, for the author's elaborate psychological analysis is not convincing, and in the end she reveals the instincts of a common prostitute. Even her deathbed scene, which Flaubert paints in lurid colours, fails to arouse our sympathy.

But from other points of view the novel is interesting, and particularly for the picture it presents of the everyday life of a French country practitioner in the early decades of the last century.

The father of Charles Bovary, whose wife plays the title-rôle in the story, held the grade of *aide-chirurgien-major* in a regiment in the days of Napoleon Bonaparte. Owing to some political indiscretion he quitted the service in 1812, and having married the daughter of a rich tradesman, he settled down as a gentleman farmer in the Pays de Caux. He was a dissolute

fellow, who cared for nothing but his own pleasure, and had it not been for his wife's firmness, his only child's education would have been utterly neglected. As it was, the boy was sent first to the *lycée* at Rouen, and afterwards to the School of Medicine attached to the great hospital of that city.

The curriculum of a French provincial school of medicine in the first half of the nineteenth century appears to have been fairly extensive. It included anatomy, pathology, physiology, chemistry, and botany, materia medica, therapeutics, pharmacy and hygiene. There were in addition courses of clinical medicine and surgery. This statement is probably correct, for Flaubert was the son of a physician on the staff of the Rouen hospital, and there is ample evidence in his writings that in his early life he was familiar with the details of medical study, and even with those of general practice.

At such a school, it is clear that a man had every opportunity of acquiring a thorough knowledge of his profession. But Charles Bovary does not appear to have been a brilliant student. In fact, there are features in his character which make one think that it would have been better if he had not gone in for medicine at all. The first time he presented himself for the examination for the humble qualification of *officier de santé* he was promptly rejected. Urged by his mother, more perhaps than by his own wishes, he returned to his studies, and the second time he appeared before the examining board he was successful.

Charles Bovary set up in practice in Tostes. There is a village named Tôtes, in the department of Seine-Inférieure, about half way between Rouen and Dieppe, which is probably the one to which Flaubert refers.

The young doctor's establishment was not luxurious. Those who have walked or cycled—motoring is no good; you can't see anything—through the Pays de Caux, that part of Normandy which lies east of the Seine and extends northwards from Rouen towards Dieppe and the other coast towns, will remember passing through villages of the same type as Tostes. The cottages, built of brick, and having tiled or thatched roofs, cluster on either side of the main thoroughfare. Among them are one or two a little larger than the others—having an upper storey, for example. It was in one of these last that Bovary found his new home. The house stood close to the roadway. The front door opened on a narrow passage, which ran straight through the building to the garden in the rear. On the right of this passage was the

salle à manger. On the left was the consulting-room. This was an apartment about six paces square. The partition, which separated it from the kitchen, was so frail that the odours of cooking penetrated freely, and the cook had the advantage of hearing the patients relate the lugubrious story of their sufferings to the doctor.

The furniture of the consulting-room consisted of a table, an armchair for the doctor, and three other chairs for the patients and their friends. There was also a bookcase in pinewood with six shelves, on which were installed the numerous tomes of the *Dictionnaire des Sciences Médicales*. Bovary had bought this work second-hand, and, although the covers had suffered many things from the various hands through which the volumes had passed, the pages were still uncut. We have to thank the modern medical publisher very much for issuing his books with the leaves ready cut. It saves our blushes when a patient, left alone for a few minutes in the consulting-room, chances from curiosity to take down and examine one of the portly volumes which occupy a place on our not overcrowded shelves.

The first important case, to which the young practitioner was called, was one of a broken leg. As Bovary rode through the night to the farm where his patient was lying, he tried to recall to his mind all that he had ever heard or read of fractures and their treatment. It must be confessed that he had no great confidence in his own skill, which was rather surprising, seeing how ignorant he was; for, as a rule, the less we know, the more confident we are in ourselves. Fortunately for both surgeon and patient the injury was not serious, and the treatment was successful.

The fee paid in this case was 75 francs, to which the grateful patient added the present of a turkey when he came to settle the account.

The daughter of this farmer became Charles Bovary's second wife, and the heroine of the story. Of the young doctor's first marriage it is only necessary to say that it was not a happy one. The poor man seems always to have had bad luck in the matrimonial lottery.

After his second marriage Charles Bovary settled down to the humdrum life of a country practitioner. At all hours and in all kinds of weather he might have been seen riding through wayside lanes. His meals were irregular. Often he was glad to eat an omelette in one of the farmhouses. Gradually his

reputation became established. The peasants loved him because he was not proud. He petted the children; he was never seen in a public-house; and, further, he inspired confidence by his morality. He succeeded particularly in the treatment of catarrhs and diseases of the chest. Always having before his eyes the dread of killing his patients, he hardly ever prescribed any but soothing mixtures, now and then an emetic, a hot foot-bath, or a few leeches. As for his practice of surgery—well, he bled his patients freely, and for the extraction of teeth he had *une poigne d'enfer*.

In order to keep himself up to date in medical science, Bovary took in *La Ruche Médicale*, a new journal, of which the prospectus had been sent to him. He tried to read a little in the evening after dinner, but the warmth of the room, the soothing influences of digestion, and the fatigue of a long day in the saddle, soon sent him to sleep. So that in the end it is to be feared that the numbers of *La Ruche Médicale* shared the fate of the *Dictionnaire des Sciences Médicales*, and found themselves on the shelves of the bookcase in the consulting-room with many of their leaves uncut.

But if Bovary was happy at Tostes, his wife was not. She was the victim, partly, of a foolish method of education, and her head was full of silly fancies. She found her life intolerably dull, and presently she developed a formidable array of symptoms, for which her husband prescribed camphor baths and valerian. As this treatment did not seem to do much good, Bovary took his wife to Rouen to consult his old master, Dr. Larivière. This worthy diagnosed a nervous breakdown—he seems to have been quite modern in his ideas—and ordered change of scene.

Charles Bovary was sorry to leave Tostes after four years of practice, and just when *il commençait à s'y poser*. However, of course, his wife's health was the first consideration, and having made inquiries, he heard of an opening in another village, Yonville-l'Abbaye, a good many miles to the east of Rouen, and in the neighbourhood of Neufchâtel. He wrote to the apothecary of the place to know what was the population of the village, the distance from the nearest medical practitioner, and the approximate income of the former doctor. The reply being satisfactory, Bovary made arrangements to move as soon as he could settle his affairs.

Yonville was a far more important village than Tostes. It possessed a large church, somewhat dilapidated; a market-place; a *mairie*, built after the designs of a Parisian architect; an hotel,

the Lion d'Or, and several shops. One of these last was the glory of Yonville—it was the apothecary's shop. The sign, which extended the whole breadth of the building, bore in huge letters of gold the words "Homais, Pharmacien." The remainder of the front of the house was covered from top to bottom with advertisements of various druggists' sundries and proprietary medicines. At night, when the interior of the establishment was lit up, the red and green colours of the two great bottles, which stood in the window, were thrown far into the dark street. Inside the shop, upon the shelves which lined the walls, bottles of all sizes were drawn up in terrible array. There were also rows of drawers labelled with cabalistic characters, and on the counter stood a large pair of scales and the private desk of the proprietor. Finally, at the back of the shop was a glass door, on the upper part of which appeared the mystic word "Laboratoire," and a little lower down the name "Homais" was repeated in letters of gold on a black ground.

As for Monsieur Homais, the apothecary, it is almost worth while wading through the weary pages of Flaubert's novel to make his acquaintance. Miss Betham Edwards, in her charming *Literary Rambles in France*, tells us that "our neighbours cite Homais now as we speak of Podsnap or Micawber." His face was slightly marked with smallpox. He usually appeared in public in green leather slippers, and wearing a Greek velvet cap with a gold tassel. Even when he dined at the Lion d'Or or at the house of a friend, he was accustomed to request permission to keep on his cap for fear of *cornzas*. Vain and conceited to a degree, he had all a half-educated man's love of argument. He prided himself upon being a freethinker of the Voltairean species, and nothing gave him greater pleasure than a wordy battle with the *cure*, in which he generally came off the conqueror. He delighted in long words, and never used a short or simple one if he could avoid it. He gave high-sounding names to his children, and he called the loft where he stored his drugs the "capharnaum." Once, when the great Dr. Larivière lunched with him, he could not refrain from using the word "saccharum" when he asked his guest whether he took sugar in his coffee.

Of course, such a man as Monsieur Homais wrote to the papers. He even seems to have had a vague idea that he was on the staff of the *Fanal de Rouen*. He was the member of one learned society—he always spoke as though he was the member of several. He had published a pamphlet on *Du Cidre, de sa Fabrication et de ses Effets*, and another entitled, *Des Observations sur le Puceron Lanigier*,

copies of both of which he had sent to the *Académie*, and he had great hopes of being one day decorated for his scientific works.

But with all his failings, the apothecary had his good points. He was a good husband and neighbour, and, like the French middle-class father generally, he was extravagantly fond of his children.

Some of the other characters, which made up the village society of Yonville, are painted in lively colours, for Flaubert has now warmed to his work. There is Madame Lefrançois, the landlady of the Lion d'Or, a good-natured gossip, who is terribly anxious about the affairs of her kitchen, and jealous of competitors in her business. There is Hyppolyte, the *garçon* of the hotel, of whom more anon. There is Monsieur Bournisien, the *curé*, a stout, red-faced man, with all the *bonhomie* of the village priest, and all his little foibles. And, not to lengthen the list unduly, there is Lestiboudois, the gravedigger. He was parish beadle as well as sexton, so that when a funeral took place he derived a double benefice from his connection with the Church. The good man was always anxious to turn an honest penny, and he hated to see the gifts of Nature neglected. Accordingly, he grew potatoes to his own profit in the unoccupied portion of the cemetery. Once, when there was an epidemic in the village, he hardly knew whether to rejoice at the increase of his income from the number of interments, or to grieve at the loss of so large a part of his potato plot.

As for Madame Bovary's lovers, who now begin to figure on the scene, they are the most uninteresting sketches of humanity to be found in literature. The one was coarse, and the other silly. We can only say that they were worthy of the lady.

The Bovarys settled down quietly in Yonville. The doctor soon became popular; the people liked him, and the *curé* spoke of him with respect. As for Monsieur Homais, the apothecary, he was kindness itself. He told Madame Bovary where she could buy the best provisions, he ordered the cider for her himself, and he took the trouble of going down into the cellar to see that the barrel was properly placed. He advised upon the important matter of buying cheap butter, and finally, he arranged with Lestiboudois, the sexton, who in addition to his sacerdotal and mortuary functions, exercised the profession of jobbing gardener, that he should look after the plot of ground in the rear of the doctor's house. Possibly there was an ulterior motive underlying the apothecary's cordiality.

Monsieur Homais was an inveterate quack, and he enjoyed a

great reputation in Yonville and the neighbourhood for his medical skill. On market days his shop was crowded with peasants who came to consult him. Now, the French code strictly debars any unqualified person from exercising the art of medicine, and the apothecary's illegal practice on one occasion brought him into trouble. He was summoned to Rouen to answer for his conduct, and he had an interview with the *procureur du roi* in his private room. Monsieur Homais was ready to die with fear. As he stood trembling before the magistrate, terrible in toque and ermined robe, he saw himself shut up in a prison cell, his family in tears, the pharmacy sold up, and all his beloved bottles scattered over the face of the earth. Fortunately, he was let off with a severe reprimand, but when he left the Court he was in such a nervous condition that he was obliged to go to a neighbouring café for a glass of rum and water before he was able to recover his usual *aplomb*.

But you cannot cure a quack. There is something so delightful in advising others, particularly when there is a little money to be made at the same time. So, in spite of his terror of the law courts, Monsieur Homais found it impossible to give up the private consultations in his back shop. Consequently, it was wise for the apothecary to be on amicable terms with his neighbour, the young *officier de santé*, for a friend was more likely to wink at his irregular practice of medicine than an enemy.

Occupied as Madame Bovary was with her amours, and she had not been many months at Yonville before she plunged in the full tide of illicit love, she still found time to be ambitious for her husband. She was only too conscious of his mediocrity, and it pained her. In her day-dreams she longed to see him rich and successful, with a ribbon or a rosette in his buttonhole. It was pure selfishness on her part, for she did not care a fig for the poor man. Only, his glory would reflect on her, and give her wealth and social position. But it seemed impossible for this obscure village practitioner to distinguish himself, seeing how moderately he was endowed with intelligence. However, one day Monsieur Homais conceived an idea which seemed to promise the fulfilment of Madame Bovary's wishes.

The work of Delpech and Stromeyer about this time had brought tenotomy, as a method of curing club-foot, prominently before the medical world. Anything that was new interested the liberal-minded apothecary. He was a village patriot also, and the idea occurred to him that Yonville, in order to keep up

with the times, ought to have operations for club-feet. There was a case ready to hand. Hyppolyte, the red-headed stable hand and general factotum of the Lion d'Or, had suffered from this deformity from his birth. What was there to prevent Charles Bovary from operating upon him, and thereby acquiring an immense reputation? And naturally—but, of course, this was only an after thought, and could have had no influence on the mind of a philanthropist—if the village surgeon's practice increased, the business of the village apothecary would flourish also.

Monsieur Homais became enthusiastic.

"What does one risk?" he said to Madame Bovary. "Examine the matter"—and he enumerated on his fingers the advantages of the attempt. "Success almost certain. Comfort and improved appearance of the patient. Celebrity quickly acquired by the operator. Why should not your husband, for example, cure this poor man, Hyppolyte of the Lion d'Or? And note, that he will not fail to recount his cure to all the travellers who stay at the hotel. And then"—and Homais lowered his voice, and looked carefully around him for fear somebody should be within earshot—"and then, what is there to prevent me from sending a little note about the successful operation to the newspapers?"

Charles Bovary had no more confidence in his own skill now than he had at the commencement of his career. Indeed, he may have had less, for most of us learn our limitations in time, although we don't always talk about them. However, he allowed himself to be convinced by his wife and the apothecary that he might possibly become a celebrated surgeon. He ordered a copy of Duval's *Surgery* from Rouen, and every evening he might have been seen with his head between his hands busily studying the book.

While the doctor in his efforts to master the subject became more and more confused between valgus, varus, talipes-equinus and talipes-calcaneus and all the varieties of club-foot, congenital and acquired, the apothecary set himself to work to induce the stable boy to submit to the operation.

"You will scarcely feel it," he argued. "A little pain, a simple prick as if you were being bled—not nearly so bad as cutting your corns."

But Hyppolyte did not seem much impressed. He only rolled his stupid eyes.

"However," continued Monsieur Homais, "it is no business

of mine. It is yours. I only speak from pure humanity. I should like to see you, my friend, freed from this ugly lameness, which must hinder you very much in the performance of your duties."

Then he attacked the man's vanity.

"Think how much better looking you will be," he said. "Think how much more you will please the ladies"—Hyppolyte grinned foolishly. "Besides, you are a man. If you are called to the colours, how can you fight with a game leg?"

Monsieur Homais went away indignant. He declared he could not understand this obstinacy, this blindness which would not take advantage of the benefits of science.

At last, after the whole village had preached to him on the subject, Hyppolyte agreed to undergo the operation on the condition that it cost him nothing.

The case appears from Flaubert's description to have been one of talipes-equinus, and Bovary, with a trembling hand, for he was in an awful state of funk, succeeded in cutting through the tendo Achillis. Then with the assistance of Monsieur Homais, who of course was present, he put the leg up in a wonderful apparatus, the work of the village carpenter and locksmith, which weighed about eight pounds, and in the construction of which neither iron, wood, leather, screws, nor bolts had been spared.

That night Monsieur Homais composed an article for insertion in the *Fanal de Rouen*.

"On Tuesday," he wrote, "our little city of Yonville was the theatre of a surgical experiment which was at the same time an act of the highest philanthropy. Monsieur Bovary, one of our most distinguished practitioners, operated on the club-foot of Hyppolyte Tautain, who has been *garçon d'écurie* at the hotel of the Lion d'Or for more than twenty-five years. The operation was performed as by enchantment. Scarcely a few drops of blood showed themselves upon the skin, and the rebellious tendon, so to speak, yielded to the efforts of Art. Everything leads one to believe that the convalescence will be short, and who knows, but at the next village *fête* we shall see our brave Hyppolyte figuring in the Bacchanal dances in the midst of a choir of joyous girls, and thus proving his complete cure by his grace and gambols."

Five days later gangrene set in. Probably the wonderful apparatus, with its many screws and straps, was to blame. Now nobody knew what to do. Bovary and the apothecary both lost

their heads. Valuable time was lost, and the case would have gone from bad to worse if Madame Lefrançois, the landlady of the Lion d'Or, had not called in another doctor. This was Dr. Canivet of Neufchâtel, who had a considerable local reputation as a surgeon. Being a doctor of medicine he naturally looked down on a mere *officier de santé*, and he laughed disdainfully as he examined the gangrenous leg. Going across the street to the apothecary's shop, he declaimed loudly against the asses who had reduced an unfortunate man to such a state.

Monsieur Homais listened to the doctor's tirade with a time-serving smile. It was necessary to be polite to Dr. Canivet, for his prescriptions frequently found their way as far as Yonville. So the apothecary did not undertake the defence of Bovary. In short, abandoning his principles, he sacrificed his own dignity to the more important interests of his business.

The next day Dr. Canivet amputated the leg. It was in the pre-chloroform days, and the cries of the patient resounded through the village, until they reached the ears of Bovary, who was shut up in his house, overcome with shame. The story of this unfortunate operation, he thought to himself, will be the subject of conversation in all the villages for miles around. It will even reach to Rouen. He, Bovary, would be ruined. Besides, Hyppolyte, if he lived, would probably bring an action against him. How was he going to survive the disgrace?

However, things turned out better than might have been expected. Hyppolyte recovered. By the advice of his wife, Bovary bought a cork leg for his late patient. This was a marvellous affair. The joints were fitted with springs, and the complicated piece of mechanism was covered with a black cloth trouser leg, and finished off with a varnished boot. But Hyppolyte dared not make use of such a handsome limb every day—perhaps the new trouser leg did not match with his old one. He begged Madame Bovary to get him a more useful one. Accordingly, her husband had to go to the expense of another artificial limb—a bucket-leg probably, as no doubt that would be more suitable for stumping about a stable-yard.

Little by little, as he became accustomed to his maimed condition, the poor fellow took up his old duties, and was seen moving about the village as before. But whenever Bovary heard the sound of the wooden leg on the pavement, he took care to go another way.

Naturally, all this was not calculated to improve a country

practice. Nevertheless, the unsuccessful surgeon would probably have lived the affair down—for his good-nature made him popular in the district—if his wife had allowed him to do so. But Madame Bovary's conduct became daily more and more disgraceful. She not only deceived her husband, but she appropriated his money where and when she could put her hands on it, in order to spend it on her debaucheries, and when everything else failed, she got herself involved in the toils of a crafty tradesman who had a taste for money-lending.

The inevitable catastrophe drew near. One day an execution was put into the doctor's house. Seeing that the whole story of her life was about to be revealed, Madame Bovary became frantic. She appealed to her lovers for help, but received none. In her distress she tried to obtain money from other rich men of her acquaintance. All was without avail. At last, in her despair, she obtained the key of the apothecary's store-room—the “capharnaum”—and poisoned herself with arsenic.

Bovary was beside himself. He summoned Homais to his assistance. But the apothecary was not much good. All he could suggest was that they should make an analysis—of what, he did not say. But he had read somewhere that it was the proper thing to do in case of poisoning, so he harped upon the subject. They sent to Neufchâtel for Dr. Canivet and to Rouen for Dr. Larivière. These two lights of science arrived in due time, but they could do nothing. And so the woman died.

As I have said above, Flaubert paints the deathbed scene in lurid colours. He throws up the high lights by touches of grim humour. Imagine the freethinking apothecary and the *cure* sitting up all night to watch the dead body, and passing the time in religious discussions, which were more animated than logical! But incongruity is said to be the soul of humour. In the most solemn part of the funeral service the congregation is disturbed by the sound of an iron-shod stick on the pavement of the church, and looking round, the mourners see Hyppolyte, the maimed stableman, who has put on his best artificial limb with the black cloth trouser leg and the varnished boot for the occasion. That night Justin, the apothecary's errand-boy, the only being in the world, except her husband, who really loved the dead woman, is disturbed, while praying beside the newly-made grave, by Lestiboudois, the beadle. Justin hurriedly decamps—for we are often more ashamed of a good deed than we are of a bad one—but Lestiboudois recognises him as he climbs over the wall, and

is satisfied now that he knows who comes by night to steal his potatoes.

The rest of the story is quickly told. Charles Bovary, whose love for his wife was genuine, was broken-hearted at her death. He brooded over it, and nothing could rouse him from his melancholy, not even Monsieur Homais' well-meant efforts to interest him in designs for the dead woman's tombstone and the inscription to be engraved thereon. Bovary died suddenly a little while after, and when Dr. Canivet kindly came over from Neufchâtel to make a post-mortem examination of the body, he found no cause for the death.

As for Monsieur Homais, he flourished. He worked the quackery department of his business so thoroughly, that he starved out three young doctors, one after another, who came to Yonville to try to take up the late Charles Bovary's practice. But Monsieur Homais was upheld by public opinion. Even his scientific attainments in the end were recognised, and he received the long-coveted decoration.

CLINICAL RECORDS.

CASES FROM THE EAR AND THROAT DEPARTMENT
OF THE ROYAL INFIRMARY, EDINBURGH.

UNDER THE CHARGE OF

A. LOGAN TURNER, M.D., F.R.C.S.E., F.R.S.E.

FOREIGN BODIES REMOVED FROM BRONCHUS
AND OESOPHAGUS.

By J. S. FRASER, F.R.C.S.,

Assistant-Surgeon, Ear and Throat Department, Royal Infirmary, Edinburgh.

CASE I. — *Pearl-headed Pin removed from Right Bronchus by Direct Bronchoscopy, in a Child of Four Years.*—G. R., aged 4 years, was admitted to the Ear and Throat Department on the 5th of July 1915. His parents stated that four months ago the child was sucking a pearl-headed pin when his little sister pushed him from behind and he "swallowed" the pin. He had an attack of choking immediately afterwards, and told his mother he had swallowed the pin. His motions were watched for some time but no pin was discovered. He had little further trouble, however, except that he continued to cough and had occasional attacks of choking. One week before admission he was taken to a local hospital where he was radiographed, but the mother says that no pin was discovered. The child was sent over from the X-ray Department to the Ear and Throat Department by Dr. McKendrick, who reported that the pin was lying in the right bronchus, head downwards (Figs. 1 and 2).

5th July 1915.—5 P.M.—Atropin given. 5.30 P.M.—General anaesthesia by chloroform and ether. *Suspension laryngoscopy* showed that the larynx was normal. Cocain was applied to the larynx and trachea on long mops by the aid of direct vision. The suspension apparatus was now removed and, with the boy still in the dorsal position with his head over the end of the table supported by an assistant, No. 4 bronchoscopy tube was passed down to the larynx so that the distal end projected just beyond the vocal cords. The outer tube could not be passed through the larynx, but the extension tube was successfully introduced through it down to the bifurcation. It was then seen that the mucous membrane of the trachea was red and that a considerable quantity of muco-purulent secretion was present in spite of the administration of atropin. Five per cent. cocain was again applied to the region of the tracheal bifurcation. The right main bronchus was now inspected and the lining membrane was seen to be red, swollen, and covered with pus; the latter was removed by

means of the evacuation apparatus. After some difficulty, the point of the pin was seen as a black line at the lower end of the right main bronchus. The head of the pin could not be seen, and it was evidently in the lowest of the secondary bronchi. It was now found that even the most slender forceps available completely blocked the view when passed through the narrow extension tube. All that could be done was to get the end of the inner tube against the point of the pin and then to pass the forceps down so as to grip the pin by feel rather than by sight. On the first occasion on which this manœuvre was attempted it was unsuccessful; but on the second occasion, when the forceps were withdrawn, it was found that the pearl-headed pin had been firmly grasped so that it came away when the forceps were removed. The bronchoscopy tube was now withdrawn and the patient returned to bed.

6th July.—Patient has had a restless night but has slept well to-day. His voice is rather hoarse. Temperature normal; pulse, 108; respirations, 32.

7th July.—The child does not look well and the breathing is very laboured. Temperature, 98° to 99° F.; pulse, 112; respirations, 30. The boy appears to have difficulty in coughing up the sputum.

8th July.—Temperature, 98°; pulse, 130; respirations, 40. About 10 A.M. to-day the patient suddenly became very cyanosed and asphyxia appeared imminent. Tracheotomy was at once performed under light chloroform anaesthesia. When the trachea was opened a considerable amount of muco-purulent secretion was coughed up and the patient's colour at once improved. 2 P.M.—Patient looks decidedly better; he is having oxygen inhalations and is getting alcohol and expectorants.

9th July.—The child has had a good night and his colour is now normal. He is still coughing up a quantity of muco-pus; taking food well. Pulse, 114; respirations, 44.

10th July.—Pulse, 100; respirations, 36. Dr. Matthewson reports dulness over right apex, as if from collapse of the lung. There is no dulness at the base. Temperature to-day is up to 99·4° F., but the patient takes food well and sleeps well.

15th July.—Patient is now only wearing the outer tracheotomy tube, which is corked, so that he is breathing entirely through his larynx. Temperature, 97° to 98° F.; pulse, 108; respirations, 28. Dr. Matthewson reports that the dulness of the right upper lobe is clearing up.

19th July.—Temperature, pulse, and respirations normal. Tracheotomy tube removed. Patient can now speak in a clear, audible voice.

3rd August.—Patient went home.

Remarks.—The larynx of a child is very small and appears to be specially liable to œdema and spasm. As events proved, it would

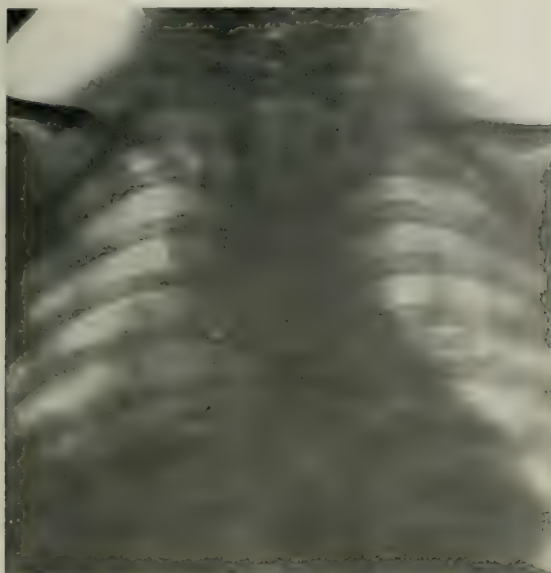


FIG. 1.—Pearl-headed Pin in Secondary Bronchus on Right Side.



FIG. 2.—Pearl-headed Pin Removed from Right Secondary Bronchus. (Actual size.)



FIG. 3.—Dilating Oesophagoscope and Long Forceps for Removal of Foreign Bodies from the Gullet.



FIG. 4.—Denture Removed from Oesophagus.

have been better in this case if tracheotomy had been performed in the first place. This would have enabled one to insert a larger bronchoscopy tube, and would also have brought the site of the foreign body considerably nearer the operator. The size of the tube to be used in bronchoscopy is regulated by the width of the glottis and not by the size of the bronchus. If a tube can pass through the glottis it can enter the main bronchus. Although no examination of the larynx was attempted after the operation it is almost certain that the child was suffering from œdema of the larynx which caused respiratory obstruction and prevented expectoration of the purulent bronchial secretion which was noted at the time of operation and was probably increased to a considerable extent afterwards.

CASE II.—*Denture in the Œsophagus*.—A. M.F., male, aged 39, was admitted to the Ear and Throat Department from the Surgical Out-Patient Department on the 27th December. The patient stated that he had accidentally swallowed a small tooth plate about an hour before his admission to the Infirmary and had felt it stick in his neck. A screen examination showed the foreign body 2 inches below the upper end of the œsophagus—*i.e.* below the lower border of the cricoid cartilage.

28th December.—Morphia $\frac{1}{4}$ gr. and atropin $\frac{1}{100}$ grs. were given hypodermically and the fauces and hypopharynx painted with 10 per cent. cocain. The patient was placed on the raised operating table in the dorsal position, with the head extended over the end of the table. The dilating œsophagoscope (see Figs. 3 and 4) was passed down through the mouth and hypopharynx into the œsophagus and the blades opened. The sharp angles of the tooth plate were found to be somewhat firmly gripped and the denture was only extracted after great difficulty. The operation lasted eighty-five minutes. In the evening there was a slight elevation of temperature—99° F. The pulse, however, was normal, and there was no swelling in the neck and little or no pain on swallowing sterilised water.

As the condition remained satisfactory, the patient was allowed to go home two days after operation. Recovery was uneventful.

Remarks.—In regard to the difficulty of removing foreign bodies from the œsophagus a great deal depends on the nature of the body. The writer has now removed a halfpenny with little or no difficulty from the cervical œsophagus of a child on seven occasions. On the other hand, he has had to deal with four dentures and met with great difficulty in every case. In only one instance was the denture successfully removed by endoscopic methods—the case just described. The first occasion was in 1909, before the introduction of the dilating œsophagoscope. The tooth-plate was easily seen in the cervical œsophagus a little below the cricoid constriction. The hook of the

plate was firmly fixed in the right lateral wall of the œsophagus, so that it could not be pulled up. Attempts to rotate it failed, and therefore the plate was pushed down into the roomy (thoracic) part of the œsophagus, so that it might be turned round. Unfortunately the long extraction forceps were out of order, and while these were being put right the tube was withdrawn. When next the tube was passed it was found that the plate had slipped into the stomach. Patient was put to bed and fed on porridge to which short pieces of Berlin wool were added. On 28th August (*i.e.* 3 days later) the plate was passed *per rectum*, surrounded with the wool. Good recovery. (*Edin. Med. Journ.*, February 1913.)

In the second case—also before the days of the dilating œsophagoscope—endoscopic methods failed to remove the body, which was successfully extracted on the following day through a cervical incision by Mr. J. W. Dowden. The patient made a good recovery. In the third case, even with the aid of the dilating œsophagoscope, the writer was unable to extract the large denture, which was removed by Mr. W. J. Stuart by external operation; again the patient made a rapid recovery.

CASE III.—*Foreign Body (Chicken Bone) in the Œsophagus.*—The patient was a man aged 50 years, who consulted the writer on the 2nd of November 1915. He stated that he had just been lunching at an hotel in Edinburgh with some friends and had been drinking champagne, talking and laughing. The patient was eating some cold roast chicken when he suddenly felt something stick in his throat. He tried drinking brandy and eating bread, but the pain continued.

When seen at 3 P.M. the patient was considerably excited but not intoxicated. The fauces were very sensitive and there was a considerable accumulation of saliva in the pharynx. Laryngeal examination was not possible without cocaine, but after this had been applied it was seen that the larynx and pharynx were normal. The patient was told that an examination with the œsophagoscope would be necessary. He was advised to go to a nursing home in order that proper preparations might be made, but he was very anxious to have the foreign body removed at once if possible. An attempt was therefore made in the consulting-room to pass the œsophagoscope, but this was entirely unsuccessful, as the patient's throat was much too sensitive. Even if the œsophagoscope could have been passed the mucous secretion was so copious that it would have been impossible to see the foreign body. The patient now consented to go to a nursing home and to have an injection of morphia and atropin. Three-quarters of an hour later the pharynx and larynx were painted with 20 per cent. cocaine, and with the patient on the operating table in the left lateral position, the œsophagoscope was passed down through the mouth of the gullet. A

small wound, about the size of a grain of wheat, was seen on the posterior wall of the œsophagus just at its junction with the hypopharynx. The distal end of the œsophagoscope was now passed through the cervical gullet into the roomy thoracic portion of the œsophagus, but without detecting any abnormality. The œsophagoscope was therefore slowly withdrawn (retrograde œsophagoscopy) and a large, greyish-yellow, pointed body came into sight lying on the antero-lateral wall of the œsophagus just below the upper opening of the tube. This body was easily removed with the slender foreign-body forceps and proved to be a piece of the breast bone of a chicken, which had somewhat the size and shape of an arrow head. It was evident that the œsophagoscope when first passed down, with its beak in close contact with the posterior and left lateral wall of the hypopharynx, had passed behind the chicken bone and had displaced the point of the bone from the small slit which it had made for itself in the posterior wall of the œsophagus. The case illustrates well the advantages of retrograde œsophagoscopy, during which the operator is not worried by the difficulty of passing the tube through the mouth of the œsophagus and has leisure to inspect carefully all the walls of the gullet.

The patient was advised to stay in the nursing home for the night on account of the slight injury to the wall of the œsophagus caused by the chicken bone. He, however, refused to do so, but promised to take nothing but sterilised water or milk until he was seen again.

When the patient reported next day he stated that he had had a good night and had been able to swallow without pain. Subsequent progress was uneventful.

Remarks.—At first sight it would appear that bronchoscopy was a more serious procedure than œsophagoscopy, but it is not so. In view of the septic condition of the lining membrane of the gullet and of the danger of mediastinitis following injuries of the œsophagus, it is advisable to exercise great care in the after-treatment of patients who have had œsophagoscopy performed—especially if there has been any injury of the wall of the gullet caused by the foreign body itself or by the manipulations of the surgeon.

A CASE OF FAILURE OF UNION BETWEEN THE VAS DEFERENS AND THE TESTIS.

By C. HAMILTON WHITEFORD, M.R.C.S, L.R.C.P.,
Specialist in Surgery, The Military Hospital, Devonport.

THE patient, aged 23 years, was admitted for operation on a right inguinal hernia, which had existed since birth. The right testis was absent from the scrotum. The left testis was fully developed and in its normal position. The hernial sac, which extended into the upper scrotum, was incised and the testis found high up in the canal. The testis, half the size of its fellow, was well-formed except that the epididymis was ill-developed, and had a well-marked mesentery. Palpation and inspection failed to demonstrate a vas in connection with the testis. High up behind, and adherent to, the posterior wall of the sac a vas of normal size was found emerging from the internal ring. The vas was coiled, and tapered away to a small nodule, measuring one quarter by one half of an inch, which on section proved to be epididymis. The nodule was adherent to the sac wall and had no connection with the testis.

A radical operation was performed, and the testis was placed in the upper scrotum.

Comments.—Non-union of the vas with the testis is scarcely mentioned in text-books on surgery, and references are few, but the condition is probably less rare than the scantiness of the literature would appear to indicate. Among those who have described this abnormality is A. C. Wood,¹ from whose article the following extracts have been taken :—

“The undescended testis, in addition to its under-development, fails to acquire its usual relation to surrounding structures. The epididymis is not closely attached to the body of the gland but is separated by a definite space.

“The mesentery, common to the testis and epididymis, which normally is short and fixes these parts closely to the peritoneum, becomes elongated, forming a pedicle.

“The testis and vas develop independently. The former, with the vasa efferentia and coni vasculosi (globus major), originates in the genital ridge on the mesial side of the Wolffian body, and the latter, with the globus minor, is derived from the Wolffian duct, which is situated on the outer border of the Wolffian body. The duct is originally closed at both ends, but, as growth continues, the testis and vas are joined by the development of intermediate tubes. When the cloaca divides into bladder and rectum, the lower end of the Wolffian duct becomes connected with the prostatic urethra through the ejaculatory duct.”

The origins of the testis and vas being distinct, arrest of development may affect either or both.

Of six cases of retained testis dissected by Wood, five showed failure of union between the vas and the testis, and in one of these the vas stopped short of the prostatic urethra.

When aspiration of the globus major with a hypodermic syringe demonstrates the presence of spermatozoa, Wood suggests an anastomosis between the vas and the globus major, employing the technique devised by Dr. Edward Martin in cases of sterility following epididymitis.

REFERENCE.—¹ A. C. Wood, "The Anatomy of Undescended Testes," *Surgery, Gynecology, and Obstetrics*, August 1915.

RECENT ADVANCES IN MEDICAL SCIENCE.

SURGERY.

UNDER THE CHARGE OF

J. W. STRUTHERS, F.R.C.S., AND D. P. D. WILKIE, F.R.C.S.

THE TREATMENT OF TETANUS.

WHILE the value of tetanus antitoxin as a prophylactic seems to be well established, its value as a curative agent, in cases where symptoms of tetanus have appeared, is generally admitted to be so slight as to be negligible. For some time past experimental and clinical evidence has been accumulating that magnesium sulphate, when carefully used, is of great assistance in controlling the spasms of tetanus, and the reports of its use are so favourable that it merits an extended trial in order definitely to determine its value.

Kocher, who has investigated the subject and recorded the recovery of severe cases of tetanus under treatment by magnesium sulphate, reports 3 additional cases (*Correspondenz-Blatt f. Schweiz. Aerzte*, No. 40, 1915), with two recoveries and one death, and formulates the following indications for the treatment of the disease.

1. Magnesium sulphate has a symptomatic curative action: tetanus antitoxin a prophylactic. The antitoxin should be used immediately in every case of wound likely to be infected with tetanus bacilli, and the injection should be repeated every eighth day until danger is past. It is unnecessary to give more than 10 c.cm. at a time [this refers to the Bern serum: the number of units is not stated, but 1000 units is a sufficient single dose.—*Abs.*].

2. When symptoms of tetanus appear, a subcutaneous injection of 25 per cent. magnesium sulphate in water should be given at once. The dose must be proportionate to the body weight, the maximum dose being 6 c.cm. of the solution, *i.e.* 1.5 gram of magnesium sulphate, per kilo. The average dose may be one-fourth of the maximum, and should be repeated four times in the 24 hours during the early days of the illness.

3. The patient must be carefully watched in order that the right moment for repeating the injection may be ascertained, namely, on the reappearance of spasms, usually along with an increase in the tonic contraction of the muscles.

4. In severe cases, where subcutaneous injection fails to control the spasms, intramuscular injection may be tried. This acts more quickly, and its effect passes off more rapidly. The dose should be two-thirds of that for subcutaneous injection, and be repeated six times in the 24 hours.

5. For the worst cases of all, where spasms succeed each other rapidly and cyanosis with involvement of the respiratory muscles is present, treatment must be more energetically carried out, and three different methods are available :—

(a) Intravenous injection of a 2.5 per cent. solution. If 100 c.cm. of this solution are run in within two minutes, the spasms will be arrested in one to five minutes. To keep up the effect of this injection it must be repeated every hour, possibly more often, and the cannula should be left in the vein for this purpose.

(b) Combination of ether anaesthesia with intramuscular injection. First, the induction of ether anaesthesia, followed by injection of 0.2 c.cm. of the 25 per cent. solution per kilo. of body weight, and continuation of anaesthesia for 20 minutes.

(c) Intraspinal injection, which gives the most certain and durable result with the smallest doses. It should be carried out under light ether anaesthesia, and the dose may be 1 c.cm. of 25 per cent. solution per 10 kilos. of body weight: *i.e.* for an adult weighing 11 stones the dose would be 7 c.cm. of the 25 per cent. solution. In making the injection the body should be horizontal and a cushion placed under the head. This position should be maintained for several hours. If the sedative effect of the injection does not extend high enough so as to affect the thoracic muscles, the cushion should be removed from below the head and the body may be tilted a little so as to depress the head. If this is carried out, it may result in a deep narcosis, which is apt to be accompanied by paresis of the respiratory muscles, rendering artificial respiration necessary. The narcosis may last as long as 24 hours. The treatment should be continued by subcutaneous or intramuscular injections after one spinal injection. Spinal injection should not be used in children, owing to the difficulty of doing artificial respiration satisfactorily.

STONE IN THE KIDNEY AND URETER.

Cabot (*Journ. Amer. Med. Assoc.*, vol. lxxv. No 15) has made an analysis of the features presented by 157 cases of stone in the kidney and ureter.

While cases occurred from the first to the seventh decade, the great majority were found in the second, third, and fourth decades, and most of all in the third; 108 cases were in males, 46 in females. While the left side was more often involved in men, the right was more often affected in women, but the preponderance was not striking.

Colicky pain was present in 96 cases, but Cabot makes the interesting statement that it was the "presenting" symptom in only 50 cases. In the remainder, pain was an occasional or unimportant symptom, and frequently elicited only on careful questioning.

Examination of the urine revealed the interesting fact that in 22

cases out of 150 it was entirely and persistently normal. Blood was present in 103 cases, pus in 109.

Out of 127 cases in which radiographs were taken, 8 were persistently negative. Cabot believes this to be a smaller proportion of negative results than is usual, and states that the Röntgen-ray as used at the present time in competent hands fails to detect stone in 10 to 15 per cent. of cases.

Cabot's favourite operation for the removal of stone is pyelotomy. He has had no cases of persistent urinary fistula after operation. He draws attention to the number of cases, 26, in which previous unnecessary operations had been done for the symptoms really due to stone, and also emphasises the fact that a number of patients do not make a perfect recovery after operation for the removal of stone; thus 49 per cent. of his kidney cases and 28 per cent. of his ureter cases were not perfectly cured by their operations, pus, blood, or albumin being present in the urine in some cases, while in others a shadow, presumably a recurrence of stone, was shown by X-ray examination.

Braasch and Moore (*ibid.*) analyse 654 cases of renal and ureteric stone operated on in the Mayo clinique, and devote their remarks chiefly to the 294 cases of stone in the ureter which occurred in this series. They found that pain was referred to the kidney region in 67 per cent. of their cases, to the upper abdominal quadrant in 15 per cent., and the region of the lower ureter in 9 per cent. They indicate that renal colic is probably more often due to stone in the ureter than to stone in the kidney. Like Cabot, they refer to cases in which pain was either not marked or not a leading symptom, but in their series these atypical cases were not so numerous as in Cabot's. A very frequent and therefore valuable diagnostic symptom was the occurrence of vesical irritability which was present in 74 per cent. of cases.

Gross hæmaturia was found in 14 per cent. of cases of stone in the ureter, and in 56 per cent. of cases of kidney stone. In 12 per cent. of the ureter cases neither blood nor pus were found in the urine, and in 9 per cent. only an occasional blood-cell was found. Braasch and Moore affirm that the practical value of the presence of a few blood- or pus-cells in the urine in the diagnosis of ureteral stone has been exaggerated. They agree with Cabot in their estimate of the number of cases in which the X-ray fails to show a stone, for in 11 per cent. of their cases the X-ray report was negative. As regards the localisation of the stone, it is interesting to note that in 159 out of 230 cases the stone was found in the lower third of the ureter, and among these most frequently in the pelvic portion just above the narrowing at the uretero-vesical junction. In 26 cases it was found at the junction of the renal pelvis with the ureter, and in 28 cases in the upper third of the ureter. In only one case was a stone found in the middle third.

In discussing treatment, Braasch and Moore state that in all proba-

bility the majority of stones in the ureter pass spontaneously, and that therefore surgical interference is not indicated with the first attack of pain. They suggest that it is rational in most cases to wait two or three months until Nature has made several attempts to dislodge the stone. They do not attach much value to various methods which have been suggested for removing stones by intra-ureteral methods, indicating that the passage of a ureteral catheter may often dislodge a stone and so enable it to be passed, while other and more complicated methods are no more efficacious.

J. W. S.

OBSTETRICS AND GYNECOLOGY.

UNDER THE CHARGE OF

A. H. F. BARBOUR, M.D., AND J. W. BALLANTYNE, M.D.

THE ORIGIN OF THE MAMMARY SECRETION.

DR. PEDRO ZULOAGA of Valladolid (*Arch. mens. d'obstét. et de gynec.*, ann. iv. 337-343, 15th September 1915) records three cases in which the flow of milk coincided with the expulsion or the separation of the placenta, and raises the question of the bearing of such observations upon the origin of the stimulus which causes mammary activity. In the first case the flow took place five months after confinement and synchronised with the expulsion of a lobe of the placenta which had remained alive; in the second case, although the foetus had been dead for three months, the mammary secretion only began when it and the placenta (which had the characters of a *hematoma subchoriale tuberosum*) were discharged; and in the third case, although the mammary activity coincided with the death of the foetus *in utero*, there was good evidence that the placenta separated at or very soon after the occurrence of the foetal death. In all these cases there seemed to be no support for the theory that the foetus influences the milk secretion, and Dr. Zuloaga raises the question whether one is therefore to look to the placenta as the active organ in this connection.

It is recalled that Keiffer, Bouchacourt, Ferroni and Satta, Halban, Bosh, and others have regarded the placenta as the starting-point of the crisogenous hormone; and that Bouchacourt, Brindeau, and Keiffer are persuaded that the secretion of milk in the new-born infant as well as in the mother has its initial cause in a substance formed in the placenta and put into circulation at the time of labour. The experiments of Bouin and Ancel, however, require to be carefully considered. These observers have divided mammary activity into two phases—a kinetic one during which there is enlargement of the gland during the pregnancy due to a chemical stimulus elaborated by the corpus luteum, and a glandular one which is under the control of some element newly

developed in the organism. Bouin and Ancel found that when virgin rabbits in a state of œstrus were put to males which had been sterilised, and when later a mechanical stimulus was applied to the uterus and that organ had developed a placenta, then a myometrial gland appeared and immediately thereafter milk secretion was set up. They therefore concluded that the glandular phase in the gestation-changes in the mammaræ was set up by the myometrial gland in the uterus, and that both phases, therefore, were dependent upon maternal elements (the corpus luteum and the myometrial gland). But, further, cases are not unknown to the gynecologist in which the breasts have been found secreting milk in the presence of some morbid state (such as a fibroid tumour or an endometritis) and *in the absence of pregnancy*; and in these cases the secretion has disappeared after the removal of the tumour or the cure of the diseased state of the endometrium. Reynier, in 1912, collected observations of this kind. Last year (1914) Bouin and Ancel reported further that the corpus luteum of the ovary in normal circumstances determined only the first phase in the gestational changes in the mammary gland; but at the same time it rendered the cells of the breasts sensitive to the action of another factor, which must be an internal secretion, and this secretion caused the mammary gland cells which were ready to be influenced by it to exhibit their secretory function. In certain experimental conditions a mechanical uterine stimulus could act in the same way as the specific hormone; possibly, therefore, the uterine disorders which (apart from pregnancy) caused a flow of milk might act in a mechanical way. Dr. Zuloaga thinks that these various facts point to the *myometrial gland* as the organ secreting the hormone, and he meets the objection that the gland exists long before the confinement and yet causes no lacteal secretion by pointing out that so long as the placenta is in position the hormone will flow to the foetus or remain in the placenta (a fact which may explain the milk-stimulating action of foetal and placental extracts), but that when the placenta has separated the products of the secretion of the myometrial gland will pass into the uterine and then into the general circulation, and after a day or two in which to produce its effect will cause a flow of milk from the breasts. The clinical facts recorded by Dr. Zuloaga fit in well into this theory of causation, more particularly if one supposes that contractions of the uterus by expressing the myometrial hormone into the blood will expedite matters. The delay in the appearance of lactation when a part of the placenta remains vitally connected with the uterine wall is thus explained, and the appearance of milk both in the new-born infant and in the mother after confinement is, of course, also easily explicable. The following deductions seem permissible:—The *crisogenous* hormone which causes the lacteal secretion to appear must be secreted by the myometrial gland. The foetus exercises no influence in determining the mammary secretion.

The internal secretion of the myometrial gland passes during pregnancy to the placenta and thence to the fetus, causing in the latter the genital crisis of the new-born described by Professor Bar. It is only after the solution of the direct connection of the placenta with the uterus that the product of the secretion of the myometrial gland goes into the blood of the mother and determines the stimulus of the mammary secretion. The involution of the uterus will favour the passage of the erisogenous hormone into the maternal blood. Finally, in the fetus, in the placenta, and in that part of the uterine tissue which corresponds to the myometrial gland, one can find, in greater or smaller quantity, erisogenous hormones capable of determining the mammary secretion; and this fact explains the results sometimes obtained from extracts of the uterus, the placenta, and the fetus. Dr. Zuloaga's contribution carries us a little further in the investigation of the complicated and somewhat mysterious phenomena which immediately follow the birth of the child and the separation of the placenta, and it has the merit of providing a theory of causation which explains not only the normal occurrence of lactation, but also the unusual appearance of milk in the breasts of the new-born infant, the anomalous non-appearance of milk in the mother after a labour in which part of the placenta has been retained, and to some extent the quite exceptional cases in which the lacteal secretion is found apart altogether from gestation. But there are links yet to be provided in the chain of evidence.

SEQUELE OF ABDOMINAL HYSTEROPEXY.

Dr. M. Muret (*Ann. de gynec. et d'obst.*, s. ii. vol. xi. p. 545, Juillet-Août 1915) points out that the uterine ventrofixation alters the physiology of the organ, and that the kind of alteration depends upon the operative method employed, the degree of the fixation, and the nature of the cicatrix. Thus the uterus may be fixed low or high, its mobility may be more or less conserved or altered, and its statics more or less modified. It is in this way that one can explain the results, sometimes quite safe, sometimes dangerous, which follow in future pregnancies. Dr. Muret affirms, however, that when the uterus is attached directly to the abdominal walls by a superficial and narrow fixation and by a hysteropexy which is situated low down both in respect to the uterus and to the abdominal wall, it most frequently takes, after a time, its normal position in the pelvis and enjoys a motility which is very nearly normal. It is otherwise, however, when the uterus has been fixed by its fundus or its superior portion, when the fixation is high up on the abdominal walls, and when it is deep-seated and very solid. Under the last-named circumstances the uterus is so made part of the anterior abdominal wall as to act with it in every particular, and, further, intra-abdominal pressure when it is

exerted, as it is in coughing, comes to act solely on the posterior aspect of the uterus. When, in addition, there is some degree of relaxation or of herniation of the anterior abdominal walls a curious paradoxical effect may be noted, viz. the elevation, instead of the depression of the uterus when the patient coughs or strains and when she rises from the lying into the erect position. Dr. Muret explains in a very interesting manner how this phenomenon occurs, and how it may be accompanied by trouble with the bladder and with pains in the pelvis. But, further, it may lead to a still more serious disadvantage; it may cause a posterior vaginal enterocele or hernia into the pouch of Douglas; and Muret give the clinical details of two cases in which this happened. One was a woman of 62, very fat, and suffering from chronic bronchitis with constant coughing. She had been operated on (not by Dr. Muret), a solid ventrofixation having been done without any coincident attempt being made to repair the torn perineum. A marked prolapsus of the posterior vaginal wall through the vulva had resulted, and this prolapsus contained intestinal coils which formed part of a marked posterior vaginal enterocele. The uterus being fixed solidly to the front, and the coughing being more or less frequent, it was easy to understand how the downward displacement of the bowel had come to pass. A reparative operation corrected the descent. The second case was one of a young unmarried woman who had suffered from incontinence of urine and persistent constipation. She had also a lumbo-sacral meningocele, and, as a consequence, paralytic flaccidity of the muscular structures in the pelvis. There was anterior vaginal prolapsus, too, with descent of the uterus. Dr. Muret did an anterior colporrhaphy and a direct abdominal hysteropexy on the fundus uteri along with sterilisation (by ligature and resection) of the Fallopian tubes. The result was a passing degree of amelioration of the incontinence, accompanied by the return, a little later, of the feeling of prolapse of the vagina. Examination showed that the uterus was high up and that the anterior vaginal wall was rectilinear and not displaced. There was, however, a marked posterior vaginal enterocele which looked at first sight as if it were a rectocele but was easily shown (by rectal examination) not to be that. In this case the fixing of the uterus forward had made it possible for the intra-abdominal pressure to drive the intestinal coils deeply down into the pouch of Douglas, and the herniation had been greatly facilitated by the defective innervation of the parts, arising from the existence of the spina bifida. In both these cases the anterior fixation of the upper part of the uterus solidly to the anterior abdominal wall had allowed the intra-abdominal pressure to play upon the recto-uterine cavity, and in both of them the vagino-perineal supports were weakened, in the one case by the unrepaired perineum and in the other by the flaccidity due to defective innervation. Dr. Muret, further, does not approve of fixing the fundus uteri

to the anterior abdominal wall by a narrow surface, a plan recommended by Fritsch, for the result is most often the formation of a fundal ligament, the *ligamentum fundale medium* of Fritsch and the *suspensory and fundal ligament* of Frank E. Taylor, and the presence of this structure leads to the risks of intestinal occlusion and other troubles. For all these reasons, and in order to avoid these disagreeable if not always dangerous sequelae, Dr. Muret strongly recommends the superficial and narrow fixation of the uterus low down both in relation to the uterus and to the anterior abdominal wall, and the good results he has obtained in 250 ventrofixations is evidence that his advice is worth following.

J. W. B.

OPHTHALMOLOGY.

UNDER THE CHARGE OF

W. G. SYM, F.R.C.S., AND ANGUS MACGILLIVRAY, M.D., D.Sc.

BLASTOMYCOSIS OF THE EYELIDS.

THERE are certain diseases of the eye which, like some affections of other parts of the body, display a preference for one race as distinguished from another, or for one locality or one occupation to the relative exclusion of others. Examples could readily be given; perhaps the most striking is that of trachoma, which possesses a very marked racial proclivity, and is at the same time greatly influenced in its distribution by climatic and geographical considerations. There has been recently described (*Ophthalmoscope*, September 1915) a strange instance of a disease thus limited, in the form of a blastomycetie infection of the eyelids. Six cases of this have been reported as occurring in the city of Memphis, Tennessee, U.S.A. In one instance only was the patient a white man, all the other examples occurring in negroes. The disease was first of all observed in the hand (1894), and some thirty or more such cases have been described. Apparently the malady is unable to affect mucous membranes; at all events, though cases have been noted in which skin, lungs, liver, kidney, bones, etc., have been invaded, in none of them has any mucous membrane suffered; in particular, in the eye cases, though the usual seat of primary eruption has been close to the outer canthus of the lids, it is in the skin and not in the conjunctiva that the lesion has been situated; even when the skin round the eye has been largely destroyed the conjunctiva has preserved its integrity, and the only damage it has suffered has been due to exposure. The first appearance is usually in the form of a papule, which speedily changes to a pustule; this rapidly spreads all round, with pus oozing from it or being readily expressed from it. The whole tumour-like mass which thus forms is

found to be practically composed of minute abscesses from the pus in which the budding yeast-like organisms can be obtained. The condition may at first be mistaken for an epithelioma or for a syphilitic or a tuberculous skin affection; the microscopic appearances, however, establish the diagnosis. No cases have as yet been observed outside the United States, and the majority have been confined to the Mississippi valley. It seems as if iodide of potassium in large doses was almost a specific in this disease.

EYE LESIONS IN XERODERMA PIGMENTOSUM.

There is a curious disease of the skin in which spots appear, to be described immediately, wherever the skin is exposed to sunlight, and which affects or may affect several children in a family although their parents have shown no such susceptibility. What causes us to take note of such cases in this place is the fact that the eyes, too, may be affected (*Ophthalmology*, Seattle, July 1915), and, further, that the reviewer has recently had under observation a case which exhibits this peculiarity to a minor degree, though Scotland can hardly be classed among the torrid countries. These spots in the skin in xeroderma pigmentosum or melanosis lenticularis (as the disease is called) may appear as early in life as in the second, or even the first year, though the skin has seemed to be perfectly normal. These spots disappear with a little scaling, but soon reappear on exposure to sunlight, and by-and-by small white blotches or freckles may be left, and even so-called "malignant" changes may form in the skin, though these are so named rather on the strength of their pathological behaviour than on that of their clinical. Occasionally they become truly malignant, invading and destroying neighbouring parts. The conjunctiva may be affected by inflammation alone, or in the tissue there may be red spots, pigment flakes, and dilated blood-vessels. By-and-by there may be marked shrinking of the conjunctiva, and the cornea may become opaque or semi-opaque; and the malignant changes which have affected the skin may invade the eyes, and call for surgical treatment. There is at the same time considerable photophobia, smarting, and "soreness" of the eyes. The treatment employed seems to have been somewhat haphazard, and to have consisted chiefly in astringents locally, and administration of cocoa butter internally, with injections of auto-serum. This test was prepared by drawing some blood from the patient himself, allowing it to clot, and then treating it in the centrifuging machine; the serum thus obtained was injected subcutaneously, and some surgeons have claimed to have obtained improvement in the skin condition by this means. So far as we have noticed, no attempt has been made to relieve the eye condition by way of eliminating the actinic rays of the light by means of red tinted glasses, or the skin by similar means.

INJURIES OF THE EYE IN RELATION TO INDUSTRIAL OCCUPATIONS.

The very great importance, in the general economy, of injuries to the eye incurred in the course of industrial occupations, and of diseases similarly induced, was the theme of some discussion at the Ophthalmological Congress held in Oxford in July last. Shuttlebotham (*Rep. Oxford Ophthal. Congr.*, 1915), who introduced the discussion, drew attention to the enormous numbers of accidents (generally) which occurred among the (physically) working classes, pointing out that, according to Government returns regarding seven great industries, in five years two million persons had received injuries sufficiently serious to incapacitate them for work for a week or more. The seven industries to which these statistics apply are mines, quarries, railways, factories, harbours and docks, constructional work, and shipping. He takes the figures for the mining population and shows how we can thus "see the great problem that we have before us; we are not dealing with a few people here or a few people there but with a very large percentage of the total workers of this country, and in the coal-mining industry we may say that, on the average, in every six years, everybody employed in the mines of this country is either killed or injured." He has convinced himself by statistics published that the number of accidents is on the increase yearly, as indeed seems to be the case absolutely, though whether or not there is an increase relative to the number of persons employed he does not bring out, nor does he seem to take into account the vastly greater inducement to a worker to report himself "injured" which is held out to him by the Compensation Act. He is strongly imbued with the feeling that in this country the people generally, and the medical profession in particular, have not grasped the situation as it should be comprehended, and have as yet failed to realise the enormous waste of useful labour involved in the temporary absence from work on the part of the injured man. We ought to use every effort alike to prevent any needless injuries and to promote rapid recovery and return to work after an injury has been received.

Speaking further on the subject of diseases induced by industrial occupations, he deals at some length with miners' nystagmus, one of the most important of these affections, at all events, from our present point of view. Two of the statements which he makes seem to us to be gravely open to criticism, namely, that "it is generally admitted that the miners who have contracted miners' nystagmus are amongst the most skilled and the most industrious of their class," and that "some refractive error or some error in the refractive media is present in a large proportion of the cases." If the latter of these statements is true (save in the sense that nine persons out of ten have an error of refraction) the former is not likely to be accurate, but we doubt the soundness of both assertions. He is strongly impressed with the need

of increased illumination in the mines, as helping to diminish the incidence of nystagmus.

A point was made by some of the speakers which may have considerable importance, namely, that, particularly in certain of the mining districts, pneumonia is sadly common; now we know that many of the most severe cases of septic ulceration of the cornea are produced by the pneumococcus, which obtains a lodgment in a cornea which has been injured by a flying particle of coal or stone. Are these two facts really related to one another? Most probably they are, and the very conditions which lead to the more local infection of the cornea are responsible also for the invasion of the lung. Collis puts forward a question not perhaps very easy to answer, since any given surgeon can hardly be in a position to speak for any district other than that in which he practises, and at that place the stone is likely to be of one kind. The question was whether injury from a flying particle of stone is more liable to become septic than one caused by a clip of metal, and whether stones differ from one another in this respect. Dusts from different stones vary very markedly, he says, in the effect which they produce when inhaled; a suggestion has been made in Aberdeen that abrasions caused by particles of dark foreign granite were more liable to become septic than in the case of home granites. These foreign stones had been found to contain a larger proportion of organic matter, and their dust appeared to stimulate microbial growth. In Leicestershire, too, it had been more than suspected that slate injuries were more dangerous than stone injuries.

W. G. S.

NEUROLOGY.

UNDER THE CHARGE OF

EDWIN BRAMWELL, M.B., F.R.C.P.

PSYCHONEUROSES OF THE WAR.

Two articles upon the psychoneuroses of the war from the pen of Professor Grasset, the distinguished neurologist of Montpellier, have appeared within the last few months. In the first of these (*Presse médicale*, 1st April 1915, p. 105) the author surveys the subject in the light of his experience up to the time of publication. He chooses the term psychoneurosis since the psychical element was present and predominant in all the cases of war neurosis he has observed. One hundred and ninety-three nervous cases in all were admitted to the Department of War Neurology at Montpellier during the first three months following its establishment. Among these, 59 patients suffered from psychoneuroses; 16 from associated functional and organic disease, while 4 cases were handed over to the department set apart

for mental disorders. Thus functional symptoms were present in 42 per cent. of the cases admitted. Grasset divides the psychoneuroses into three groups—the “sensitivo-motor psychoneuroses,” the “sensorio-motor psychoneuroses,” and the “emotional and mental psychoneuroses”—according to their predominating features, although it must be clearly recognised that the characteristic symptoms of more than one group may be present in the same case.

The group of “*sensitivo-motor psychoneuroses*” includes those cases which present the well-known symptomatology we are accustomed to associate with traumatic hysteria, typically exemplified by a characteristic functional hemiplegia, with hemianæsthesia, and, it may be, contractures, narrowing of the visual fields, amblyopia without changes in the fundus of the eye, etc. Although the deep reflexes may be increased, Babinski’s sign is never present. Unlike the organic hemiplegias the patient is often unaware of his sensory defect, a circumstance which Grasset explains by the retention of deep sensibility. The distribution of the symptoms is usually determined by the site of the wound. Thus in these cases the defect is usually on the side of the wound, whereas in cases of organic hemiplegia the reverse is commonly the case. Sometimes a kyphosis and, it may be, a slight degree of scoliosis are observed, the deformity usually, but not always, disappearing when the patient assumes the recumbent posture. Further, the symptoms are sometimes referred to the viscera. Thus a circulatory form is observed which resembles Graves’ disease, and is characterised by palpitation, tachycardia, perspiration, tremor of the hands, and marked pulsation of the arteries. A respiratory type is also seen which is accompanied by respiratory inconvenience, such as difficulty in taking a deep breath, rapidity of the respirations, or paroxysms of dyspnoea. In this group may be included cases of aphonia due to paralysis of the vocal cords. Again, a digestive type which manifests itself in dilation of the stomach, constipation, mucous colitis, etc., is also seen. Hystero-genetic zones, stimulation of which determines the existence of local hyperæsthesia and is succeeded by emotional disturbances, are not infrequent, while anæsthesia of the cornea and pharynx, disturbances of speech, emotional instability, physical lassitude, and defective concentration are of common occurrence in all these cases.

The “*sensorio-motor psychoneuroses*” included cases in which vision, hearing, and the function of speech are essentially disturbed. As the author indicates, words, writing, and mimicry form the expressive side of the sensory motor mechanism concerned with these functions. Amblyopia and contraction of the visual fields are, it is true, often present in the classical case of hysterical hemiplegia which typifies the “sensitivo-motor psychoneuroses,” but they do not constitute the essential feature. On the other hand, in the group now under considera-

tion, vision, hearing, and speech are either abolished or profoundly disturbed. These cases are very rarely met with in civil life, and it is probable that a much greater nervous shock is required to produce them. Eight instances were observed by Grasset in the period mentioned. The onset of symptoms often follows a violent commotion, such as the bursting of a large shell which carries the soldier several yards and may bury him completely. When he regains consciousness he finds that he is unable to see, hear, or speak. Vision usually returns first, then hearing, and, lastly, speech. The sense of hearing, as a rule, returns gradually in one ear and then in the other, while normal speech often comes back slowly, being preceded in some cases by a period of aphonia, dysarthria, stammering, or a form of abbreviated speech in which the patient suppresses the articles and useless words.

The "*mental and emotional psychoneuroses*" constitute a group which is distinguished by predominant mental and emotional symptoms, such as pronounced disturbance of sleep, change of character, and accentuated emotional instability. When, for instance, one presses upon the scar of a wound, intense pain is complained of, and emotional symptoms are evoked, such as a sensation of contraction at the throat, rapid respirations, great restlessness, or an attack of weeping. The patient's expression may assume an attitude of terror; he may cry out, tremble all over, and perspire freely. This agonising emotion is the essential feature which occupies the foreground and distinguishes the present group of cases. The emotional state may be a constant feature, or it may appear in paroxysms. The transition between the simple emotional psychoneuroses and the mental psychoneuroses is an insensible one.

When we regard the *etiology* of the psychoneuroses of war, it is interesting to note that it is not the most serious wounds, but those which are attended by the greatest shock, which most often produce the psychoses. Often the patient recovers from a period of unconsciousness to find that he is paralysed, blind, deaf and dumb, or tremulous. In other cases the symptoms appear slowly, it may be after the wound has healed. Such cases should arouse suspicion, especially if at the time of their appearance the patient has spent a good deal of time in hospitals, and more particularly if he has been on leave with his family. It is difficult to arrive at conclusions as to the influence of a neuropathic heredity in these war cases, for the patient is apt to gloss over any hereditary defects in his desire to establish the war as the sole agent responsible for his symptoms. A factor of much more importance in relation to etiology is the circumstance that when the individual is wounded he is usually physically overwrought, and his resistance to the nervous shock consequently diminished. Psychoses may, of course, develop quite apart from wounds, and, in

such circumstances, no doubt the family history and the individual's previous history are of greater etiological moment. The question of the factor which determines the particular type and localisation of the psychoneurosis is a matter of extreme interest. A case in point was that of a traumatic deaf-mute who was the father of two deaf and dumb children.

The treatment of the psychoneuroses of war is considered in more detail by the same author in a later paper (*Presse médicale*, 28th October 1915, p. 425). Needless to say, the problem is one of great importance. The neurologist is not concerned with the treatment of the malingerer. The recognition of malingering is by no means always an easy matter, but once the malingerer is detected he is to be handed over to the military authorities. Fortunately, these cases are uncommon. On the other hand, there are many patients who exaggerate their symptoms, and many who make no effort to get well, although an effort of the will on their part is essential for their cure. These patients, as anyone knows who has had to do with the treatment of the psychoneuroses, are most troublesome, for they assume a passive attitude which aggravates their condition and has a bad influence upon the other patients in the ward.

The author advocates three forms or degrees of treatment. Firstly, the ordinary or persuasive form; secondly, isolation with severe discipline; and thirdly, military re-education.

The persuasive form of treatment, which is successful in many cases, consists in persuading the patient that he both can and must get well if he wishes to do so. An appeal is made to his patriotic and family feelings; he is promised a holiday if he gets well rapidly, while, if he does not improve, more severe measures must be resorted to. In addition, the usual adjuncts to treatment by persuasion are to be employed, viz. hydrotherapy, electricity, massage, and exercises. An essential to success is the co-operation of a numerous, competent, and loyal staff. The author remarks in this connection that he has made patients who were brought into the ward on a stretcher, unable to stand, walk without sticks and with little support, but that it sometimes happened that when he was unable to continue to give them his individual attention the improvement was not maintained or, at least, did not progress.

These measures, however, do not succeed with a certain number of subjects who are not malingering, but who do not wish to be cured, and who will make no effort to this end; for the method above mentioned, it will be noted, demands the active collaboration of the individual. Under such circumstances the patient should be strictly isolated and treated with severe disciplinary methods. Professor Grasset has recently obtained a ward of twenty-six beds, each bed surrounded by curtains. The patients in this ward are allowed

no leave, they play no games, and they see no visitors, while they are promised a holiday if a rapid cure is effected. Although the organisation of this ward is too recent for the deduction of conclusions as to the results, the author is satisfied that the method will certainly increase his proportion of cures.

Even these measures are not sufficient to cure all cases. Professor Grasset proposes to institute for certain obstinate cases a system of military re-education, which he thinks will yield satisfactory results by re-educating the will of these patients. Thus cases of mutism or loss of power in an upper limb, while still remaining under medical supervision, will leave the hospital and form a military company with regular military discipline.

Finally, there comes the question of the return to duty. This is easily answered in the case of those who recover rapidly, for they may be sent back to their regiments immediately or after a short furlough. The matter is not difficult to decide in the case of those who are unable to return to the front, but who are fitted by their trade to directly assist in connection with the war. There are, however, a small number of patients who resist all therapeutic measures, who cannot be cured for military purposes or made use of in any other way. They cannot be certified as unfit and incurable, and, at the same time, they cannot be kept indefinitely in the military hospitals, occupying accommodation which might be devoted to a more useful purpose. Professor Grasset suggests that patients whose symptoms have persisted for a year should be discharged with a reasonable gratuity. Although this solution does not appear to him to be ideal, it is, in his opinion, perhaps the best way of meeting the difficulty. He has asked the Minister of War to consider the matter and intimate the line to be adopted in connection with these cases.

THERAPEUTICS.

UNDER THE CHARGE OF

JOHN EASON, M.D.

THE TREATMENT OF KALA-AZAR.

THE *Indian Medical Gazette* of October 1915 contains two short contributions on the treatment of kala-azar by tartar emetic. In the first of these papers Sir Leonard Rogers states he first used a one per cent. solution in small doses of less than one c.c., but rapidly pushed it up to several c.c. With the larger doses he found it more convenient to have a two per cent. solution and to give the injections every two or three days, gradually increasing the dose from 2 c.c. up to 10 c.c. unless nausea and gastric pain occurred. He has seen no injurious

effects from these doses. A fine sharp needle is essential. A little blood is first drawn up into the syringe to make sure that the vein has been entered. It is important that no tartar emetic should be allowed to escape subcutaneously. In one case a little of the one per cent. solution escaped into the tissues around the vein and a small slough resulted.

It was not until doses of 4 or more c.c. of the one per cent. solution were given that any material change other than temporary reduction of fever was noted. In some cases rigors followed the larger doses, but after a time they ceased and the temperature remained at a low level or at the normal point. Weight was steadily gained, and a marked improvement resulted in several instances, including reduction in the size of the spleen. In all cases the diagnosis was verified by spleen puncture, which is most essential in testing any treatment for kala-azar. On repeating this procedure after cessation of the fever the parasites were found to be greatly diminished in numbers and small and shrunken in appearance in several cases, as is often seen in patients on the road to recovery. Three patients at this stage felt so much better that they would not remain longer in hospital. They cannot be regarded as cured, although a long experience leads Rogers to believe that some at least of them are likely to recover completely in time. Blood examinations showed a considerable increase of the leucocytes in most of the cases which improved. The leucocytosis did not occur as a rule until after the cessation of the fever, so that it is apparently not a direct effect of the drug, which probably acts on the parasites themselves and is thus specific.

In three boys cancrum oris developed. This complication is common in kala-azar. In the small series of thirteen cases of kala-azar treated by tartar emetic the high percentage of cancrum oris complications may have been a coincidence. The observations covered a period of two months and the results obtained were: six cases much improved, two improved, one unchanged, three worse, and one died. Rogers says that when it is taken into account that the cases admitted to hospital are usually in a very advanced stage of the disease, frequently with serious complications, these results are distinctly promising. Owing to the disadvantages of the intravenous method, especially in young children with small veins, Rogers has recently tried injections of five per cent. finely divided metallic antimony in the form of an ointment, making the application every three days. Although the patients appear to be improving, it is too early to say whether this method will prove to be of value.

Dr. E. Muir writes very enthusiastically of the tartar emetic treatment. He states that with the exception of emetine in amoebic dysentery he has never seen a specific work a more rapid and striking

result in any disease. He has given the treatment in twelve cases, in nine of which the diagnosis was confirmed by finding the parasite in spleen punctures, and of these, with the exception of one who came in the very last stage of the disease, all have either recovered or are recovering. Muir used a one per cent. solution, and his initial dose was 4 c.c. An injection was given every second day, the dose being increased each time by 1 c.c. up to 10, unless there were signs of nausea, when it was decreased by 1 c.c. and then gradually increased again. Marked improvement occurred even after the first injection. Appetite was very decidedly improved, and the spleen greatly decreased in size after the second injection. The colour of the patient changed rapidly from the characteristic blue, which gives the name to the disease, to a normal colour. It should be said that Muir used, in conjunction with tartar emetic, intramuscular injections of turpentine, which he had formerly used alone. The turpentine injection consists of a solution of turpentine one part in camphor-creosote, one part of each, and olive oil two and a half parts; of this up to ten minims are injected into the muscles of the back on either side of the body.

In one case severe coughing was always induced by the injection of tartar emetic. If the injection is given on a full stomach, and the patient is allowed to walk about immediately after, there is often vomiting. Otherwise there were no ill effects.

The encouraging results that are thus being obtained by Rogers and by Muir are important. Rogers was led to try the tartar emetic treatment by reports on the value of antimony preparations in the treatment of sleeping sickness. It appears, however, that Gasper Vianna has already recorded the successful treatment of cases of dermal leishmaniasis occurring in South Africa. Thereafter, in Sicily, G. Cristana and G. Cavonia successfully treated cases of the Mediterranean variety of kala-azar (*Tropical Diseases Bureau Bulletin*, April 1915).

PYORRHOEA ALVEOLARIS.

In July 1914 M. T. Barrett, in a paper read before the Pennsylvania State Dental Society, stated that in 46 consecutive cases of pyorrhœa alveolaris he had observed entamœbæ in the pus, and that local applications of a half per cent. solution of emetine hydrochloride caused their disappearance. In September of the same year C. C. Bass and F. M. Johns of New Orleans confirmed this discovery. They found the amœbæ in 85 out of 87 cases, and they obtained similarly favourable results by the use of emetine hypodermically. Sir Leonard Rogers (*Indian Med. Gazette*, April 1915) recently made a microscopic examination of the pus in a very chronic case of the disease in a doctor, and found numerous active amœbæ, as many as five being visible in one field of the microscope. A grain of emetine was injected

subcutaneously, and on the following day only a few sluggish amœbæ were found, while after a second dose of emetine they entirely disappeared from the pus, and the gums showed slight improvement after four bi-weekly injections of emetine; pus was still abundant although no amœbæ could be found, and vaccine is now being tried. In two other patients, who were improving under autogenous vaccines, no amœbæ were found, but in one of two untreated cases they were present. Rogers thinks that probably a combination of vaccines and emetine will be the best treatment of this obstinate disease, and promises to be effective even in severe cases which have resisted all local treatment. H. I. Gosline (*Boston Medical and Surg. Journ.*, 22nd July 1915) reports the results obtained by him in the treatment of 42 cases of pyorrhœa alveolaris by emetine hydrochloride. He gave $\frac{1}{2}$ grain twice daily subcutaneously and applied ipecacuanha wine to the gums twice a day for one week, followed by a second week's treatment in which the gums were swabbed with the wine and an injection of $\frac{1}{2}$ grain of emetine hydrochloride was administered daily. In 87 per cent. of the cases with very spongy gums marked improvement occurred. A group characterised by loose teeth and spongy gums showed marked improvement in 78 per cent. of the cases. Some mild cases were treated locally with wine of ipecacuanha, but these showed only moderate or slight improvement.

TREATMENT OF PANCREATIC INSUFFICIENCY.

Drs. E. I. Spriggs and A. I. Leigh (*Quart. Journ. Med.*, October 1915) have made a very thorough study of a case of pancreatic insufficiency in which they obtained a consecutive series of analytical data from both urine and faeces before and after the administration of various pancreatic and other ferments. The case was diagnosed by the presence of fatty stools of enormous bulk, in which more than half the fat in the food and one-third of the nitrogen was lost, the wasting, and the glycosuria, taken with the failure to demonstrate trypsin in the faeces.

Fresh pig's pancreas, trypsin, glycerine extract of pancreas, holadin, liquor pancreatis, papain and pankreon were given for test periods.

Results.—*Fresh pig's pancreas.*—The absorption of fat was decreased. The percentage of nitrogen absorbed was slightly increased in one period but definitely less in another.

Trypsin.—Four tablets were given three times a day. An increased absorption of fat resulted, viz. 8 per cent., a third more than when no trypsin was included in the diet. The bulk of the faeces was also reduced by 10 per cent. The absorption of nitrogen was less.

Pankreon.—Glycerine extract of fresh pancreas, holadin, and papain. The fat absorption was not improved by any of these. Less fat was absorbed than in the control periods. The absorption of nitrogen appeared on the whole to be slightly improved. In the case of *pankreon* the improvement was well marked.

All the above ferments, except fresh pancreas and trypsinogen, irritated the intestinal tract and caused the patient serious discomfort.

The increased rate of passage of material appeared to be responsible for the deficient absorption of fat in this case, and probably, they suggest, much better results, such as are reported by others, would have been obtained had the intestine been less irritable.

A comparison of the figures for split fat in these periods show that lipolysis was not much affected. On the average the proportion of fat split was 2 or 3 per cent. less than when no ferment was given.

It was found that the emulsified fat of milk was much better absorbed than the fat of butter, meat, or cod-liver oil. The percentage absorbed was less than when a large quantity of fat was given.

TREATMENT OF HYPERTHYROIDISM.

Leigh F. Watson (*Journ. Amer. Med. Assoc.*, 25th September 1915) has used quinine and urea injections in fifty cases of hyperthyroidism, and he has drawn the following conclusions from the administration of over 200 injections in these cases:—

The method is recommended only to control the symptoms of hyperthyroidism in cases of toxic goitre. The injections do not remove the tumour in atoxic goitre, and they do not relieve the symptoms of advanced toxic goitre when the vascular and nervous systems have been permanently damaged. The result of the quinine and urea injection depends on the amount of tissue destroyed. In experienced hands the injection is harmless, almost painless, and there is no subsequent discomfort. It is suitable for use only in hospital. The gradual improvement of the exophthalmos in certain patients following the quinine and urea treatment points to a nerve control exerted by the thyroid on the exophthalmos. The greatest field of usefulness for the injections will be found in cases of early hyperthyroidism not severe enough to require operation.

Before giving an injection into the substance of the thyroid, the site of injection is anaesthetised with a 0·1 per cent. cocain or 0·25 per cent. novocain solution infiltrated into the skin, subcutaneous tissues and muscles, down to the gland. The syringe is then detached and the needle thrust carefully into the body of the goitre. After ascertaining that there is no fluid in the thyroid and that no blood or air comes through the needle, the syringe is attached and the infiltration slowly made.

The quantity usually given is 4 c.c. of a 30.50 per cent. solution of quinine and urea. The injections are repeated every third day. Eight to fifteen infiltrations are usually necessary to produce a marked improvement in the general symptoms and the disappearance of the bruit over the superior thyroid arteries. In cases of recent cystic goitre with moderate symptoms of hyperthyroidism, Watson aspirates the fluid and gives one to three injections. In five cases of this kind treated early in 1914 the tumour has disappeared.

NEW BOOKS.

The Origin and Nature of the Emotions: Miscellaneous Papers. By GEORGE W. CRILE, M.D., Professor of Surgery, School of Medicine, Western Reserve University. Edited by AMY F. ROWLANDS, B.S. Pp. 240. With 76 Illustrations. Philadelphia and London: W. B. Saunders Co. 1915.

STUDYING clinical facts in the light of the Darwinian theory and testing his conclusions, wherever possible, by experimental methods, Professor Crile is always an original and illuminating writer. The present volume consists of a collection of eight addresses, all dealing with different aspects of the same problem. It will be convenient to consider their contents as a whole.

Man, according to the author's philosophy, is essentially a motor being. To all stimuli proceeding from his environment he responds with muscular activity. Words and thoughts are motor symbols, and the emotions are mental representations of ancestral deeds—fear represents flight, anger conflict, love union. Their phylogenetic character is manifest in their physical signs—the most civilised of angry men will exhibit not only fists but also teeth. In emotion the whole body is integrated for action. Organs not directly concerned in the transformation of the bodily store of latent energy into motion are thrown out of gear, while the "kinetic system," consisting of brain, liver, muscles, thyroids, and adrenals, is set running at full speed. The *role* of the adrenals has been demonstrated by Cannon: Crile regards the Nissl substance as an unstable compound of adrenalin with certain elements of the brain-cells. The thyroid secretion is less amenable to experimental tests, but the clinical evidence of myxedema and Graves' disease leaves little doubt that it acts by accelerating the rate of discharge of nervous energy. When emotion is not followed by action—as happens most often in man, the slave of social conventions—the products of stimulation must be eliminated unconsumed. Hence the effects of emotion are most injurious when it is suppressed. Overwhelming emotions produce psychic shock, marked histologically by changes in the brain-cells (chromatolysis and even cell destruction) and

in the cells of the other kinetic organs. Short of this, an overstrained kinetic system will give way at its weakest link; and according as this link is the brain, liver, thyroid, or adrenals, the result will be neurasthenia or even insanity, glycosuria or diabetes, colloid or exophthalmic goitre, cardio-vascular disease, etc. Or again, protracted inhibition of the digestive functions may lead to gastric disorders, intestinal stasis, auto-intoxication. Or yet again, the excretory organs may fail to meet the stress, and Bright's disease ensue.

So much for psychic stimuli; but it has been stated that all stimuli produce a kinetic reaction. Obviously Professor Crile's "mechanistic theory of disease" is far-reaching. It is impossible here to do more than mention a few of the interesting points which he discusses—exophthalmic goitre considered as a disease of the whole motor mechanism; the kinetic response of the body to the attacks of micro-organisms; the distribution and adaptation of the pain and tickling ceptors; the shockless operation (anoci-association); and a new physiology of laughter, which has been touched on elsewhere. The last paper deals with experiments on H-ion concentration in the blood, and develops the view that the reaction of the brain to acidity—stimulation of the centres in the medulla and inhibition of those in the cortex—is a protective mechanism which prevents the animal from killing itself by over-exertion, and that it is this mechanism which renders general anaesthesia—a phenomenon of acidity—possible. The whole book is fertile in suggestion and deserves to be carefully studied.

The Gynecology of Obstetrics. By DAVID HADDEN, B.S., M.D. Pp. xv. + 198. With 79 Illustrations. New York: The Macmillan Company. 1915. Price 17s. net.

WE confess to a feeling of disappointment after the perusal of this book, which bears such an attractive title.

One is in entire agreement with the author when he urges the importance of operative repair of injuries sustained during labour, both from an immediate and a more remote point of view, and we cannot but give him credit for much painstaking anatomical and pathological work in his attempt to elucidate the principles which underlie all such treatment. He has done well in emphasising the importance of attending to the fascial structures, in addition to the muscular elements, in dealing with the various plastic operations—a point which is often lost sight of by gynecologists, and which is such an important factor in conducing to successful results.

As "an exposition of the pathologies bearing directly on parturition" one cannot admit that the author is justified in including such subjects as fibrosarcoma, primary tuberculosis of the cervix, and ptosis of the kidney, while altogether omitting any reference to fistulae and

puerperal retro-displacement of the uterus, not to speak of pelvic thrombosis and abscess, pyosalpinx, and red degenerations of fibroids.

No mention is made of the use of the subcuticular suture in the operation of perineorrhaphy and of the great advantages of this method.

The coloured photographs of the dissections of the pelvic floor in the cadaver are beautifully reproduced. It is a pity, as the author admits, that they are so small, as it makes it difficult for anyone not already familiar with the anatomical details to follow them clearly.

The photomicrographs are good, and clearly illustrate the normal and pathological cervix; a serious drawback for reference is that they are not numbered. A book of this sort, purporting to be on such arbitrary lines as its title suggests, should at any rate avoid taking an exaggerated outlook, and make certain of including what legitimately falls within its scope. The publishers deserve credit for the excellence of their department.

Manual of Embryology. By A. MELVILLE PATERSON, M.D., F.R.C.S.,
Professor of Anatomy, University of Liverpool. Pp. 391.
London: Henry Frowde and Hodder & Stoughton. 1915.
Price 10s. 6d. net.

PROFESSOR PATERSON'S manual is based upon the lectures which he has been in the habit of delivering to his medical students. It is convenient in size, well printed, and richly illustrated by figures which for the most part are boldly diagrammatic and add enormously to the ease of following the very lucid text. So far as is compatible with an accurate presentation of our knowledge, the author has adopted a reasonably and pleasantly dogmatic method of statement which the medical student will be the first to appreciate. Ontogeny is, as Professor Paterson says, "dependent on, and inextricably bound up with, phylogeny." But for students approaching the subject after full courses in zoology and anatomy, elaborate references to comparative embryology are not necessary, and this volume is proof that a perfectly coherent account of human development can be given without overloading the pages with references to what occurs in the chick, rabbit, hedgehog, and other lower animals.

Professor Paterson has kept in view the ultimate use which his readers may be expected to make of his teaching, and explains fully in the different sections the nature of the more common errors of development that may be met with in the human body.

The book is one that may be cordially recommended to students and to all others who seek a simple, accurate, full, and authoritative account of an extremely fascinating and complicated subject.

Simplified Infant Feeding. By ROGER H. DENNETT, B.S., M.D. Pp. 345. With 14 Illustrations. Philadelphia and London: J. B. Lippincott Co. Price 12s. 6d. net.

DR. DENNETT, who is adjunct Professor of Diseases of Children, New York Post-Graduate School, hits the mark when he says that "So much has been written upon the theory of infant feeding that the general practitioner is lost in its mazes." With his large experience in teaching post-graduate students he realises that what the busy practitioner requires in trying to get up a working knowledge of infant feeding is not too much theory, but something concrete in the form of a book which will tell him just how to feed the different babies with whom he comes in contact day after day.

His book—*Simplified Infant Feeding*—is certainly one of the best practical books we have read on this subject. It is interestingly written, and the teaching is sound. After giving a synopsis of the text in Chapter I, he devotes his second chapter to points in the taking of the history of a bottle-fed infant. He then takes up the question of the proper quantity of food to supply the caloric needs of the child. After reading this chapter one wonders where the difficulties in caloric feeding come in. He is a strong advocate for three-hourly feeds—that, of course, is a point on which there is a marked difference of opinion. Year by year, however, more practitioners are going on those lines and finding them advantageous. Other chapters are taken up with breast feeding, diarrhoea, constipation, etc., and all are treated in a very practical way. This book ought to be widely read.

An Index of Prognosis and End-Results of Treatment. By Various Writers. Edited by A. RENDLE SHORT, M.D., B.S., B.Sc.(Lond.), F.R.C.S.(Eng.). Pp. viii. + 570. Bristol: John Wright & Sons, Ltd. 1915. Price 21s. net.

THE *Index of Prognosis* is a carefully arranged work with many excellent articles, although, like all works which are composed of articles written by a number of contributors, the merits are unequal. The editor claims in his preface that "this volume is unique; nothing of a similar character has appeared before or can compare with it." In view of the fact that a book of prognostics occupies an important place in the works of Hippocrates, and that the subject has been handled by numerous writers in the course of the intervening centuries, the editor's claim seems rather too sweeping, and his estimate of the merits of his book somewhat extravagant. We may, however, frankly admit that as an alphabetical cyclopædia of prognosis it is well planned and competently executed. The statistics on which the writers base their conclusions are naturally of varied character and clinical value, but, after making allowance for this, there remains a

solid substratum of good work that is likely to stand the test of time and will prove of service to many physicians and surgeons. Writers whose contributions to medical subjects may be noted as specially interesting are the late Sir Thomas Clouston, who has contributed a lengthy article on mental diseases; Dr. Carey Coombs, who writes on the various diseases of the circulatory system; Dr. Poynton on rheumatism; and Dr. Purves Stewart on nervous diseases. In general surgery a large number of clear and thoughtful articles are contributed by the editor, whilst one may select amongst other articles for special mention that by Mr. Greer on fractures and by Mr. Sherren on surgical diseases of the stomach. The book will serve as a very useful supplement to ordinary text-books, for in the latter the questions of prognosis usually receive far too scanty treatment.

Emergencies in Medical Practice. By Sanitätsrath Dr. RICHARD LENZMAN, Duisberg. Translated from the Third German Edition by RONALD E. S. KROHN, M.D., London. London: John Bale, Sons & Danielsson, Ltd. 1915. Price 21s. net.

THIS book is not a pocket *vade mecum* on what to do in emergencies in general practice, but an elaborate scientific treatise on the symptoms, diagnosis, and treatment of those morbid conditions which may suddenly overtake an individual—well or ill—and bring him perilously near the gates of death. The emergencies considered are medical, surgical, and gynæcological—indeed, all the emergencies with which a medical practitioner may be brought face to face.

The book is well written and admirably arranged, dealing with the different systems in rotation—*e.g.* under the nervous system, sudden loss of consciousness is considered, its causes, differential diagnosis and treatment; under the respiratory system, hæmorrhage from the respiratory tract, occlusion of the respiratory tube, and diseases of the lung itself are all discussed, and so on.

The last section is devoted to poisons, and this includes a chapter on anaphylaxis or serum sickness. In this the author gives the practitioner some very important indications by means of which he may be able to protect his patients from accidents that may arise owing to neglecting to take anaphylactic processes into account. Operations which a general practitioner may be called upon to perform in an emergency are not too minutely described, but an exception is made in the case of tracheotomy, to which twenty pages are devoted. There are very few printer's errors, and the translation as a whole is well done, but it is doubtful if the general English reader will understand what the word "choana" means.

Diarrhoeal, Inflammatory, Obstructive, and Parasitic Diseases of the Gastro-Intestinal Tract. By SAMUEL GOODWIN GANT, M.D., LL.D.
Pp. 604. With 181 Illustrations. Philadelphia and London:
W. B. Saunders Co. 1915.

PROFESSOR GANT, the Professor of Diseases of the Colon and Lower Bowel at the New York Post-Graduate Medical School and Hospital, has gathered together in the present volume a large amount of information upon the subject of diarrhoea and its innumerable causes. It is impossible to study the book without acquiring a large amount of information and many useful suggestions, and the great importance of a careful study of every case of chronic diarrhoea is well known to the experienced practitioner. Whether it is possible to induce the patient who may have sought medical advice after experiencing a few loose motions to submit to what the professor calls routine treatment, or rather routine examination, and thereafter routine treatment, is somewhat questionable.

A considerable amount of space is given to the proper examination of the stools where a diagnosis has still to be sought for, and the illustrations are of great value in demonstrating the methods of examination and treatment to which the book refers. There is occasionally a want of precise detail, where, for example, in cases of maggots involving the bowel or intestinal myiasis the use of a strong carbolic acid, chloroform, or other antiseptic is recommended for local lavage, but without stating strength or method of application. We might suggest that in the next edition such details ought to be added, and their addition would save an enormous amount of unnecessary trouble to the practitioner who seeks advice from the book.

The printing, illustrations, and prescriptions at the end of the book, and the index are worthy of every commendation.

Life: A Poem. By BASIL GORDON MORISON, M.D. With a Preface and a Memoir by an Editor. Pp. xvi. + 79. With 2 Illustrations. London: Baillière, Tindall & Cox. 1915. Price 3s. 6d. net.

THE author of this little volume was an alumnus of our Alma Mater who, after acting as assistant demonstrator of anatomy there for some time, settled in the north of London—a district pregnant with literary associations—where he spent many industrious years of professional life. Interested in the scientific aspect of medicine himself, he was instrumental in founding the Æsculapian Society of London, which still exists in a state of prosperity. Morison, however, had other interests than those of a scientific character, and had a great love for literature, but it was only the day before his death that he divulged the existence of the manuscript poem now transferred to the cold, printed page. The subject is one which might well commend itself to

any physician poetically inclined, for who sees more of life in all its aspects? The poem begins by describing the successive stages and developments of an ordinary life. It then passes on to premature death, life's uncertainty, and the joys and sorrows of human experience. The mystery of life is next dealt with, and then a dialogue takes place between the Spirit of Life and man regarding life as it ought to be—and perhaps may be in some other sphere—and life as it is experienced on our own planet. Like Shakespeare, in the famous 66th Sonnet, man, perplexed by the seeming triumph of evil, almost despairs, but, under the encouraging influence of the Spirit, takes fresh courage. A higher note is struck, and the immortality of the soul and the triumph of righteousness are foretold.

At places the poem lacks lucidity owing to defective punctuation, and in Stanza VIII. "excellent," we imagine, should read "excelling."

NEW EDITIONS.

Urgent Surgery. Vol. II. By FELIX LEJARS. Translated by W. S. DICKIE, F.R.C.S., and ERNEST WARD, M.D., F.R.C.S. Seventh French and third English Edition. Pp. 576. With 2006 Illustrations. Bristol: John Wright & Sons, Ltd. 1915. Price 25s. net.

THE second volume of this book is written in the same lucid and forceful style as the first. This volume deals with urgent conditions of the genito-urinary organs, rectum and anus, strangulated hernie, and the extremities. In connection with the last section one had hoped for an account of the results of the author's experiences in military surgery, but this edition has evidently been completed by M. Lejars before the commencement of the war, and none of his methods of treatment vary sufficiently from those generally in vogue before the war to call for very special comment. In dealing with recent infected wounds he recommends the free use of tincture of iodine, with thorough opening up of the deeper planes. In the treatment of compound fractures he favours the application of plaster splints as the best means of immobilising the limb.

We need not repeat what was said in commendation of the first volume other than to say that this book, being obviously the fruits of a long personal experience in all aspects of urgent surgery, can scarcely be surpassed as a guide to specialist and practitioner alike. The translation was interrupted by Mr. Dickie being ordered to France with the British Expeditionary Force and was completed by Mr. Ward. It has fortunately suffered in no way from this change, and the vigour and clearness of M. Lejar's style have been well preserved throughout.

The Operations of Surgery (Jacobson). By R. P. ROWLANDS and PHILIP TURNER. In Two Volumes. Sixth Edition. Vol. I., pp. x. + 1030; Vol. II., pp. 934. With 797 Illustrations. London: J. & A. Churchill. 1915. Price £2, 10s. net.

THIS standard work on operative surgery has now reached a sixth edition, and although Mr. Jacobson has relinquished his share in the work of revision, it still retains the mark of his master hand, and of his exceptionally well-stored mind. Without altering the scope of the work, which is intended for the use of young surgeons recently appointed to hospital staffs, and for those who are preparing for the higher surgical examinations, the authors have made various changes necessary to bring the subject-matter into line with recent advances in surgical procedures. This they have done with great discrimination, and they have furnished us with a reliable guide to present-day surgery.

The section on the surgery of the abdomen has been rewritten, and is in every way satisfactory. Judiciously selected clinical cases are introduced, and the main text is supplemented by a number of footnotes. The question of footnotes is a vexed one, but we have always considered those in "Jacobson" particularly useful, and could wish that the authors had brought them more fully up to date; most of those in the present edition date some years back.

Other sections which bear evidence of very thorough revision are those on the brain and on the special subjects—ear, nose, and throat—and the chapters dealing with gynecology.

Many new illustrations have been added, and in this respect the value of the work is greatly enhanced. We can confidently recommend this work to those who desire a comprehensive and reliable guide to practical operative surgery.

Surgical Materials and their Uses. By ALEXANDER MACLENNAN, M.B., C.M.(Glas.). With 277 Illustrations. London: Edward Arnold. 1915. Price 4s. 6d.

THIS is a very good practical book, written in six sections, being the outcome of lectures and demonstrations given in the Western Infirmary, Glasgow. Section 1 on Bandages is excellent, although neither the axillary bandage nor the trefoil for the head is mentioned. The sections on splints and dressings are eminently practical. We thoroughly agree with the author's observations in Section 4 on Antiseptics Dissolved in Alcohol, also with his views regarding iodine and iodoform, although unorthodox.

Whether the articles on the question of tempering instruments and on soldering splints are likely to be of much use in these days of specialisation is very doubtful. The statement that "catgut must be wound round some rigid structure" when being prepared by

Jellet's method is also one we question. The illustrations are clear and to the point, although the space in Section 6 devoted to the illustration of a few surgical instruments is, we think, of doubtful utility.

Handbook of Medical Diagnosis. By J. C. WILSON. Fourth Edition. Pp. xxii. + 1441. With 441 Illustrations. Philadelphia and London: J. B. Lippincott Co. 1915. Price 25s. net.

THREE years have elapsed since the third edition of this work was issued. In this new edition many minor changes and the addition of much new matter have been made. The section of diagnosis by the Röntgen rays has been entirely rewritten by Professor W. F. Manges, and the nosological classification of Brill's disease as a sporadic form of typhus fever has been accepted in accordance with the results of the most recent clinical and laboratory findings. Adequate descriptions of many new tests have now been included; among others, mention may be made of those on the macroscopic agglutination test in enteric fever, the luetin test in the diagnosis of tertiary syphilis, the Abderhalden diagnosis of pregnancy, the functional diagnosis of renal efficiency, and the complement-fixation test in the diagnosis of gonorrhœa. Cushing's arrangement of the clinical types of dyspituitarism and the results of Flexner's experimental work on acute poliomyelitis are given. A number of new illustrations have been inserted.

Of the 1400 odd pages in this work 600 are devoted to the description of diagnostic methods. The large remainder resembles a text-book of systematic medicine in defining diseases and discussing their etiology, symptoms, diagnosis, and prognosis. The only manner in which the second part of the work differs from a text-book on the practice of medicine is that it contains no reference to treatment. Although there is consequently much unnecessary writing in the work entitled a *Handbook of Medical Diagnosis* one is constrained to minimise this drawback in view of the general high standard of the book.

Diagnostic and Therapeutic Technic: A Manual of Practical Procedures Employed in Diagnosis and Treatment. By ALBERT S. MORROW, A.B., M.D. Second Edition. Pp. xviii. + 834. With 860 Illustrations. Philadelphia and London: W. B. Saunders Co. 1915. Price 21s. net.

THE second edition of this work by Dr. Morrow can be thoroughly recommended to the medical profession. In it the author describes in accurate detail most of the diagnostic and therapeutic techniques of known practical value. The book contains, amongst others, chapters on anesthetics, both general and local. The collection and preservation of pathological materials, exploratory punctures, the treatment of neuralgia by injections, administration of salvarsan, Bier's congestion

treatment and sphygmomanometry, whilst other diagnostic and therapeutic measures are dealt with in chapters on the alimentary and genito-urinary tracts, the ear, the nose, and the throat. A notable omission, however, is the absence of a chapter on the eye where some description of the ophthalmoscope and its use in diagnosis might have been expected; otherwise the book is well up to date, clearly printed in fairly large type, and profusely illustrated with many useful sketches. As a reliable book of reference it should prove most helpful to the general practitioner, and especially to resident medical officers of general hospitals in their clinical work.

A Manual of the Practice of Medicine. By A. A. STEVENS, A.M., M.D.
Tenth Edition. Pp. 629. With 17 Illustrations. Philadelphia
and London: W. B. Saunders Co. 1915. Price \$2.50.

WHEN a text-book reaches its tenth edition, it means that it has filled a useful place, and that repeated revisals have kept the volume abreast of the advances in medical knowledge. A number of new articles appear in the present issue, and numerous additions and alterations have been made throughout the book.

There is an immense amount of information compressed into small bulk, but a book of the kind seems to us to possess a greater value for the student revising his work before an examination rather than for the medical tyro.

The illustrations are good, and the binding in soft leather is most attractive.

An Index of Treatment. By Various Writers. Edited by ROBERT HUTCHISON, M.D., F.R.C.P., and JAMES SHERRAN, F.R.C.S.
Pp. xvi. + 1143. With 82 Illustrations. Bristol: John Wright & Sons, Ltd. 1915. Price 21s. net.

THIS book has now reached its seventh edition within the short period of eight years. It is a well-arranged work on medical and surgical matters, and should be found most useful to the busy practitioner and student alike. The book possesses a long list of contributors of the highest standing, whose articles are well written and concise, without being too lengthy or cumbersome.

The book has been revised and new articles have appeared on sterility, radium therapy, and psychoneuroses. In the article on radium therapy a description is given of how and where radium is employed in the treatment of disease. There is, however, no mention of the use of it in exophthalmic goitre, where one has seen it to be of great value. It is a matter for regret that, in a work of such excellence otherwise, the illustrations should be so few and so poor.

Pathological Technique. By F. B. MALLORY and J. H. WRIGHT.
Sixth Edition. Pp. 536. With 174 Illustrations. Philadelphia
and London: W. B. Saunders Co. 1915. Price 13s. net.

THE sixth edition, revised and enlarged, of this well-known guide to students and specialists, by Professors Mallory and Wright, has now appeared. The fact of a sixth edition is in itself proof of the practical value of the work of these authors. On the other hand, continuous progress in pathological and bacteriological methods requires that a work on the lines of that under review should embody the latest advances, and this can certainly be justly claimed.

The three main divisions deal with post-mortem, bacteriological, and histological technique respectively. The whooping-cough bacillus of Bordet and Gengou, the granuloma- and gumma-forming fungi—blastomycetes and sporotrichium Schenkii—fall into line among the pathogenic micro-organisms. Bensley's method for fixing and staining mitochondria, Schultze's reaction for the detection of intracellular oxidising ferments and differentiation of myelocytes from the lymphocyte series, the histology of the pancreas in its connection with diabetes mellitus, an extension of the Wassermann technique to gonorrhoeal infections, and Lange's colloidal gold test of cerebro-spinal fluid in syphilis are all features of importance for the specialist. As a book of general guidance it has gained a prominent place which the new edition can be fully expected to enhance.

The clear type makes an easily read page, and the photomicrography—mostly from original preparations—is of excellent quality throughout.

Applied Anatomy. By G. G. DAVIS. Third Edition. Pp. 630. With
631 Illustrations. Philadelphia: J. B. Lippincott Co. 1915.
Price 24s. net.

IN this volume the author deals in an able manner with the subject of applied anatomy. The descriptions of the various parts are clear and concise, and interspersed throughout the text there is a wealth of surgical and pathological information which not only serves to emphasise important and anatomical detail but renders the book interesting.

The illustrations are numerous and excellent. No definite system of nomenclature has been adopted. It is such, however, as will readily be understood by those accustomed to the B. N. A. or to the older terminology.

In the third edition there have been few alterations; a little new matter has been added, some of the cuts have been improved, and the text corrected.

This volume affords the student an excellent means of revising anatomy for practical purposes, and well deserves a wide popularity.

A Laboratory Manual and Text-Book of Embryology. By CHARLES WILLIAM PRENTISS, A.M., Ph.D., Professor of Histology in the N. W. University Medical School, Chicago. Philadelphia and London: W. B. Saunders Co. 1915. Price 17s. net.

THIS is an excellent modern manual of embryology written on the plan of Minot's *Laboratory Text-Book of Embryology*. The various stages of early development are described in the chick, pig. and human embryos, and in certain cases naked-eye dissection is employed. The illustrations, plain and coloured, are well executed. The work is of special value to the student of medicine owing to its special descriptions of human stages and of the human placenta and cord. We can cordially recommend it.

Cancer: Its Cause and Treatment. By L. DUNCAN BULKLEY, M.D. Pp. 230. New York: Paul B. Hoeber. 1915. Price \$1.50 net.

ON such an important subject too much work cannot be done, and the main thesis of this work is the effect of excessive purin diet as a factor in the production and aggravation of this disease. The writer's argument is embodied from the researches of others as well as his own 744 cases, and in all these last he finds deranged metabolism present with its evidences in the blood, urine, and saliva. While not ignoring the use of surgical methods and X-rays, greatest emphasis is laid on the use of vegetarian diet, the avoidance of tea, coffee, eggs, and milk. The results recorded are very striking. The book is to be recommended as well and clearly written by one whose opinion bears weight.

A Simple Method of Water Analysis. By JOHN C. THRESH, M.D., D.Sc., D.P.H. Eighth Edition. Pp. 69. London: J. & A. Churchill. 1915. Price 2s. 6d. net.

AN eighth edition of this well-known booklet has been issued. Dr. Thresh has simplified the methods of water analysis until a novice might almost attempt the task with a probability of success. Long before the recent researches into the bactericidal effects of chlorine and hypochlorous acid, the author had shown their lethal effects on the *B. typhosus* and the *B. coli* in water. In fairly pure water even 1 part chlorine to 5 million parts water will within half an hour kill these organisms. But the only safe rule is to add more chlorine than is likely to be absolutely necessary. This, however, always renders the water unpleasant to drink. The addition of sodium thiosulphate, however, removes this taste entirely. As an aid to our soldiers in the field, Dr. Thresh has perfected a method of purifying water by means of tabloids of chlorated lime.

Infant Health: A Manual for District Visitors, Nurses, and Mothers.
By Miss J. S. C. MACMILLAN, C.M.B. Pp. 128. London: Henry
Frowde and Hodder & Stoughton. Price 2s. net.

THIS little manual, written in simple language, gives most useful information as to the care and treatment of the mother before and after confinement. It also deals in a sound practical manner with the hygiene of the infant. It should prove of value to those for whom it is written.

Pocket Medical Dictionary. By W. A. N. DORLAND. Ninth Edition.
London and Philadelphia: W. B. Saunders Co. Price \$1 net.

SINCE its first appearance eighteen years ago Dr. Dorland's *Pocket Medical Dictionary* has enjoyed a well-merited popularity. Students of medicine and the allied sciences will continue to find it admirably suited to their requirements. The ninth edition now before us has been revised and enlarged, and forms a compact little volume of nearly 700 pages. Printing, paper, and binding are all that can be desired.

BOOKS RECEIVED.

- CANNON, W. B. Bodily Changes in Pain, Hunger, Fear, and Rage (D. Appleton & Co.) 7s. 6d.
CLINICS of John B. Murphy, M.D., Vol. IV. Nos. 3 and 4 (W. B. Saunders Co.) —
COLWELL, H. A., and S. RUSS. Radium, X-Rays, and the Living Cell (G. Bell & Sons, Ltd.) 12s. 6d.
COOLIDGE, A. Diseases of the Nose and Throat (W. B. Saunders Co.) —
BRADLEY, O. C. The Structure of the Fowl (A. & C. Black) 3s. 6d.
DESPARD, L. L. Handbook of Massage for Beginners (Frowde, and Hodder & Stoughton) 6s.
DORLAND, W. A. N. The Illustrated Medical Dictionary. Eighth Edition (W. B. Saunders Co.) —
DUCKWORTH, W. L. H. Morphology and Anthropology. Vol. I. Second Edition (Cambridge University Press) —
GEF, S. Medical Lectures and Aphorisms (Frowde, and Hodder & Stoughton) 6s.
HARRIS, E. F. French for the Front (E. Marlborough & Co.) 3d.
HELLMAN, A. M. Amnesia and Analgesia in Parturition (Twilight Sleep) (H. K. Lewis & Co., Ltd.) 6d. 6d.
HOWELL, W. H. A Text-Book of Physiology. (W. B. Saunders Co.) 6d. 4
KELSON, W. H. Diseases of the Throat, Nose, and Ear (Frowde, and Hodder & Stoughton) 8s. 6d.
M'KENZIE, R. T. Exercise in Education and Medicine. Second Edition (W. B. Saunders Co.) 6d. 2.50
PHILIP'S Popular Mannikin or Model of the Human Body. Edited by W. S. FURNEAUX (G. Philip & Son) 3s. 6d.
PRESTON, M. E. Fractures and Dislocations (Henry Kimpton) 31s. 6d.
RAMSAY, A. M., J. D. GRANT, H. L. WHALE, and C. E. WEST. Injuries of the Eyes, Nose, Throat, and Ears (Frowde, and Hodder & Stoughton) 2s. 6d.
SUNDERLAND, S. Old London's Spas, Baths, and Wells (Bell, Sons & Tinsclissen, Ltd.) 7s. 6d.
TRANSACTIONS of the American Urological Association, 1914. Vol. VIII. (Lippincott, Lane) —
WARREN, R. A Text-Book of Surgery. Vols. I. and II. (J. & A. Churchill) 25s.

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